Network Capabilities Update

Amstelveen 29 November 1995

Ron Kruize

Technology Overview Agenda

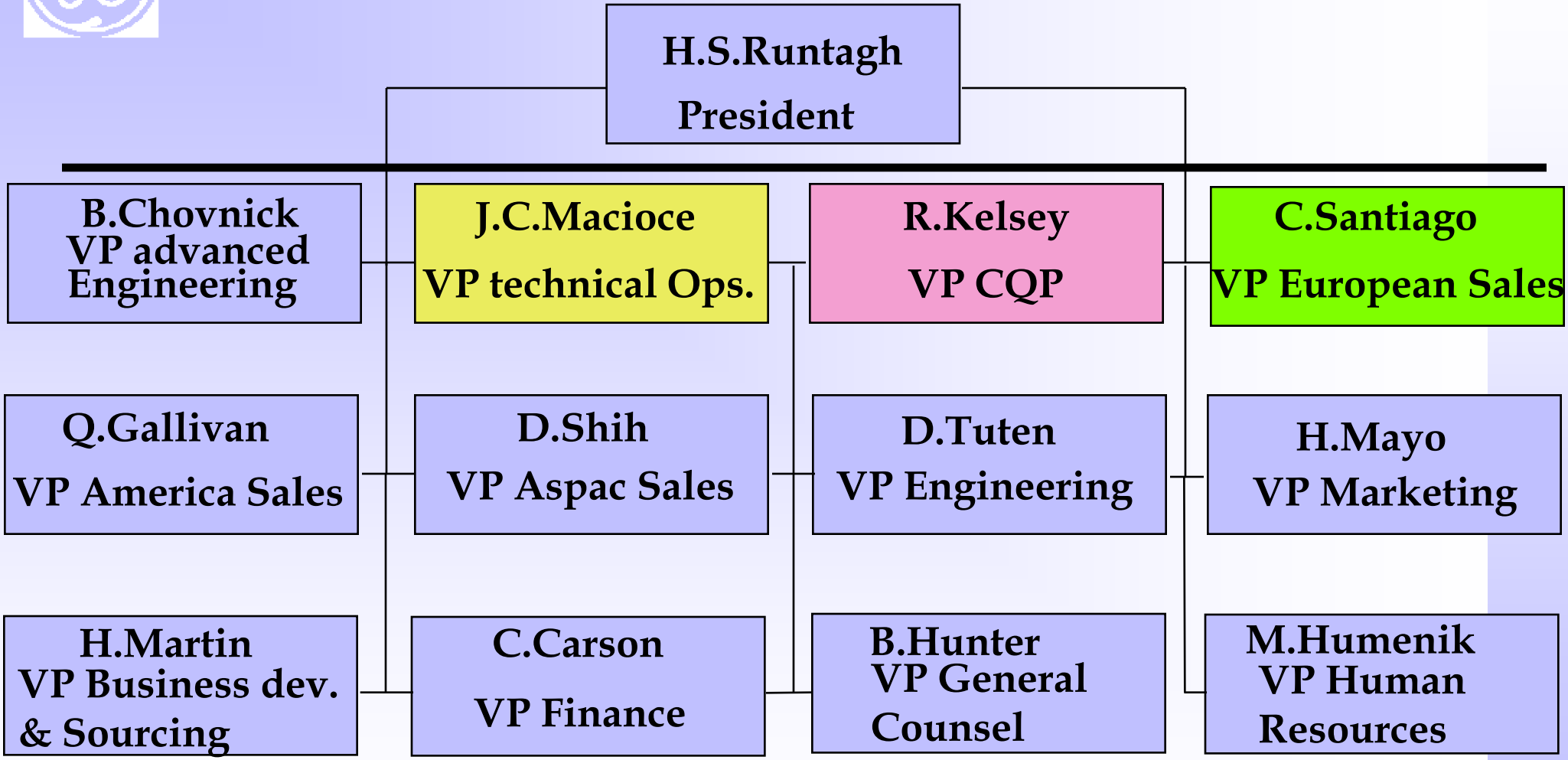
- GEIS organization
- Company direction
- GEIS Networks
- Consolidated backbone
- Internet
- Quality
- Security
- Q&A

- **Supercenters in Ohio, Maryland and Amstelveen**
- **Headquarters in Rockville, Maryland**
- **500+ Computers; 15000 simultaneous Network Users**
- **Dial-up access from 750+ cities World-Wide**
- **21 Manned Network Service Centers**
- **Three Processing Platforms; MKIII, MK3000,Unix**

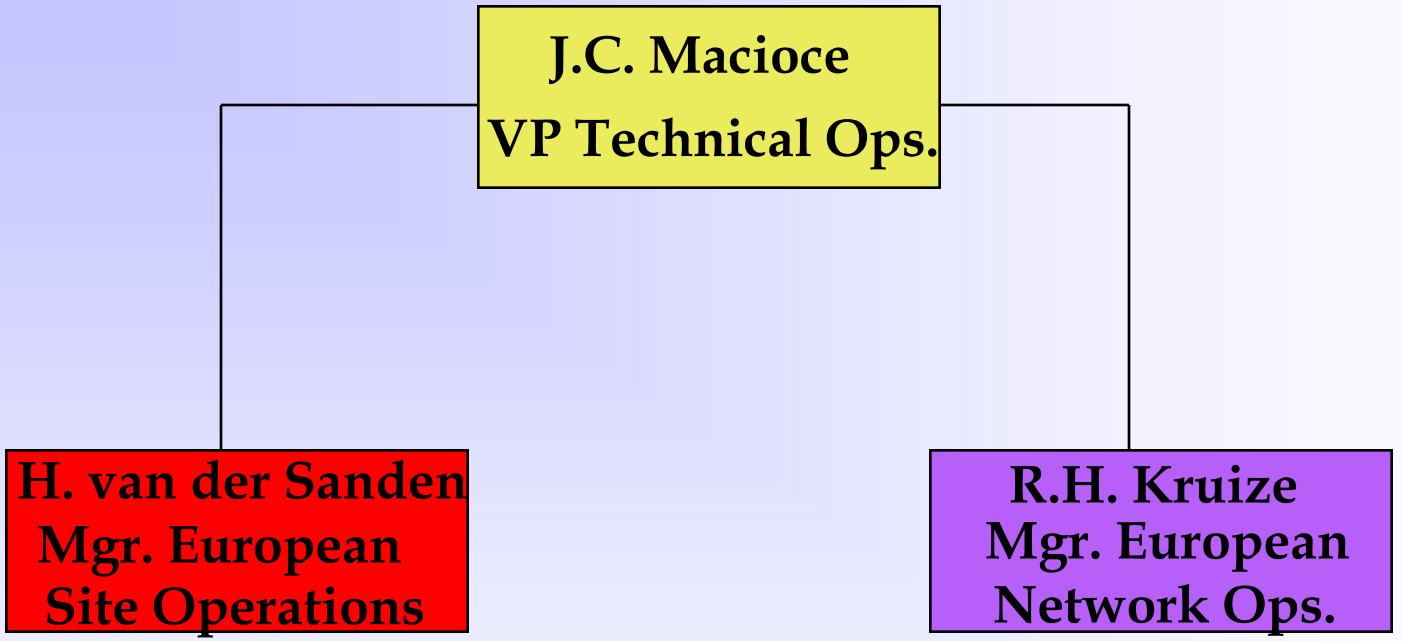
Organization Overview

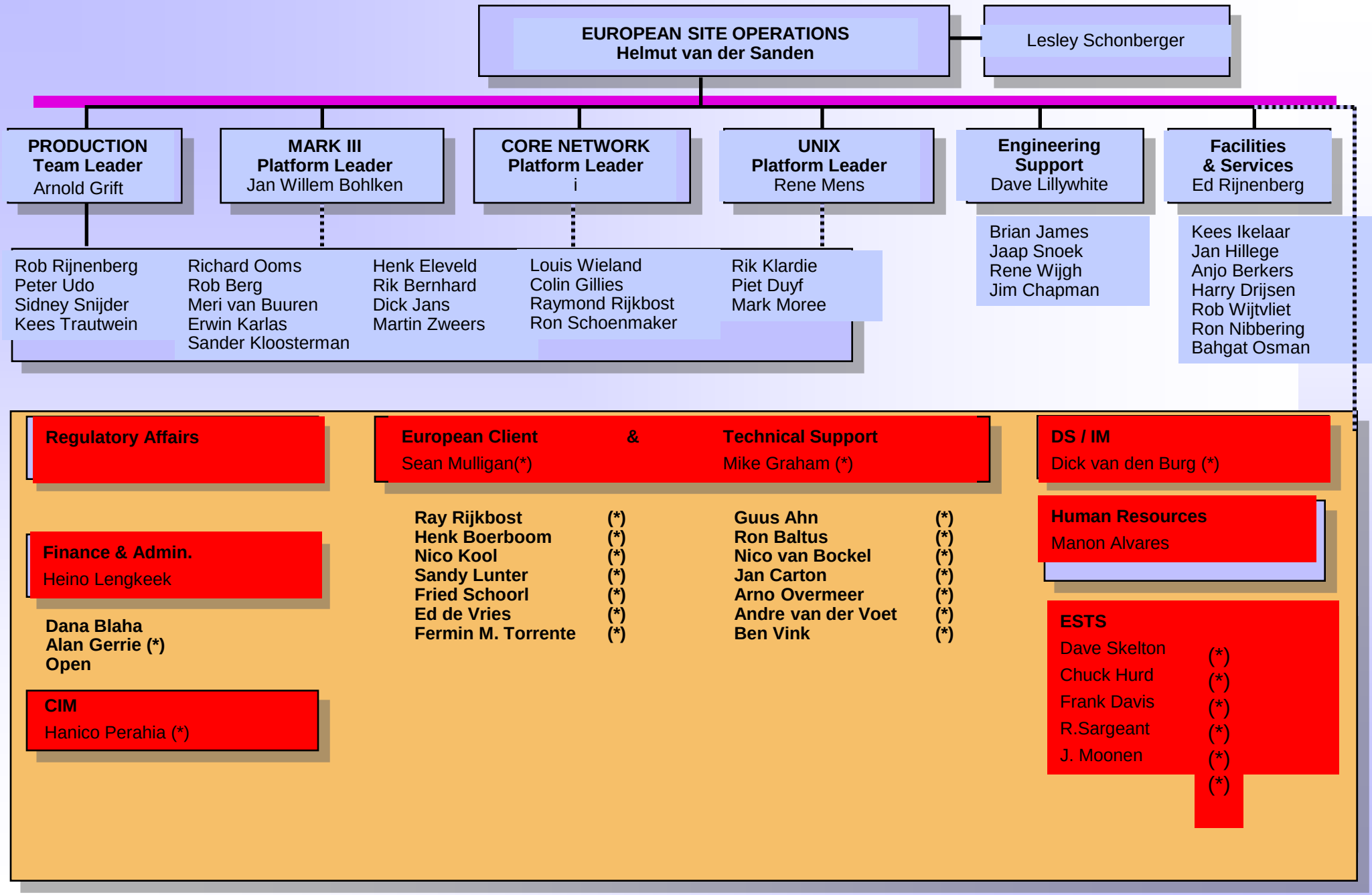
Organization Overview

Geis Organization



Geis Organization

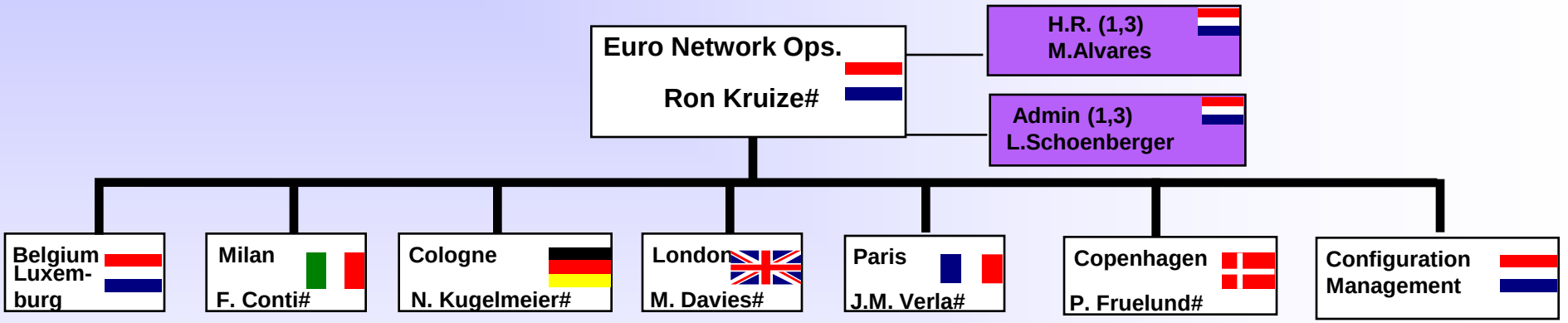




Effective February 1, 1995

(*) Not in headcount European Site Operations

Organisation Chart European Network Operations



C.v/d Aardweg(*)
P.Duin(*)

R.Bertolotti
A.Caglio
L.Cappelletti(1)
P.Vitalini
S.Pistis
J.M.Vicente(3)

B. Koll(1)
P. Maubach
W.Iking(2,4)
W.Schmitz
R. Friedrich(2,4)
I. Zilio

S. Balenthiran
S. Bowles
B. Wilkie
P. Enright
J. Hypolite(1)
S. Marshall
N. Sarangdhar(3)

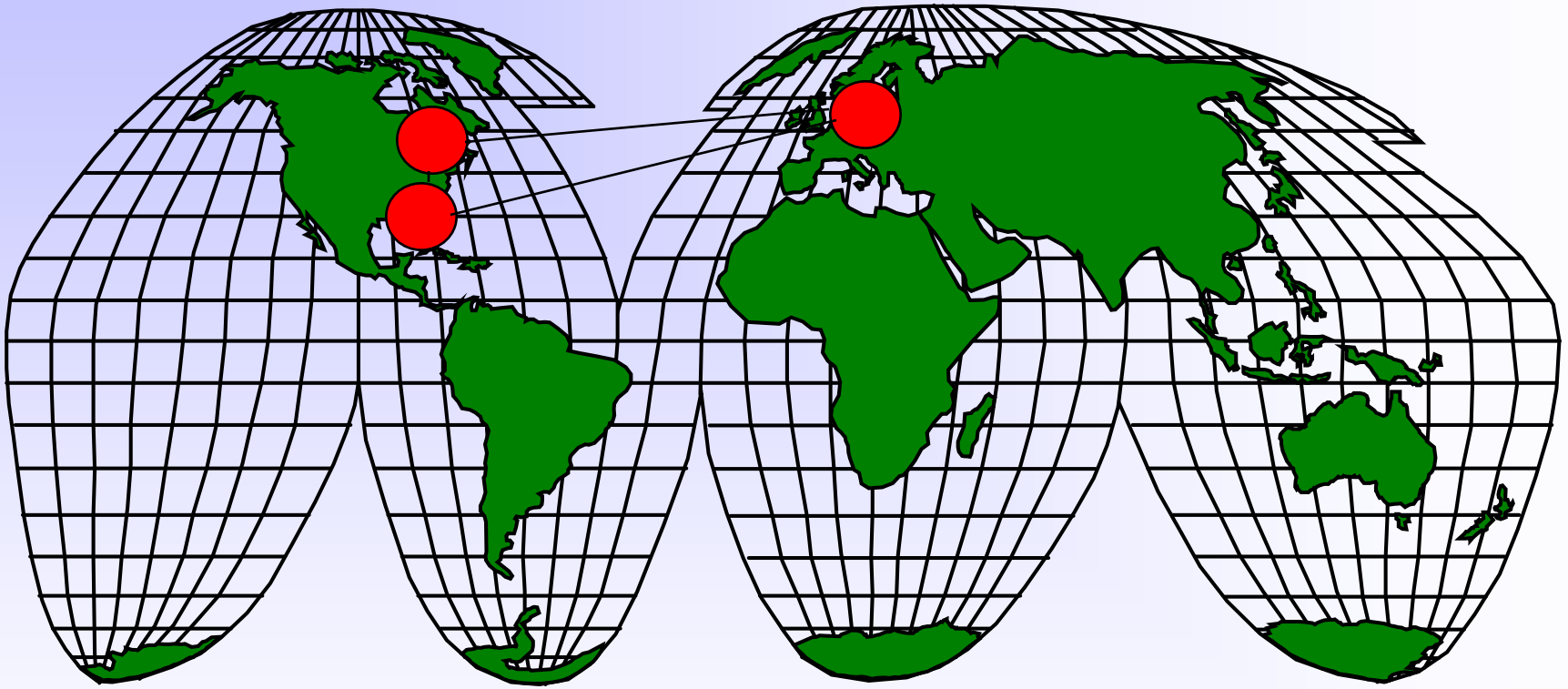
C. Bogya
open

J. Pingel
J. Qvist
D. Christensen(1)

P. Brown
F. Kars -01/96

(*) split responsibility NSC/CM
(1) Female employee
(2) new hire in 1995
(3) Not in Euro Ntwk headcount
(4) New to GEIS
(#) Manager

Geis Organization



Network Control Centers (NCC's) in:

Cleveland, Ohio
Rockville, Maryland
Amstelveen, The Netherlands

NSC=Network Service Center

- Low profile facility
- Access control
- UPS & Generator (where permitted)
- Multiple telephone exchange connections
- Staffed 07:00-19:00 (+ on-call)
- A-B switching & back-up components
- Educated Datacommunications Specialists

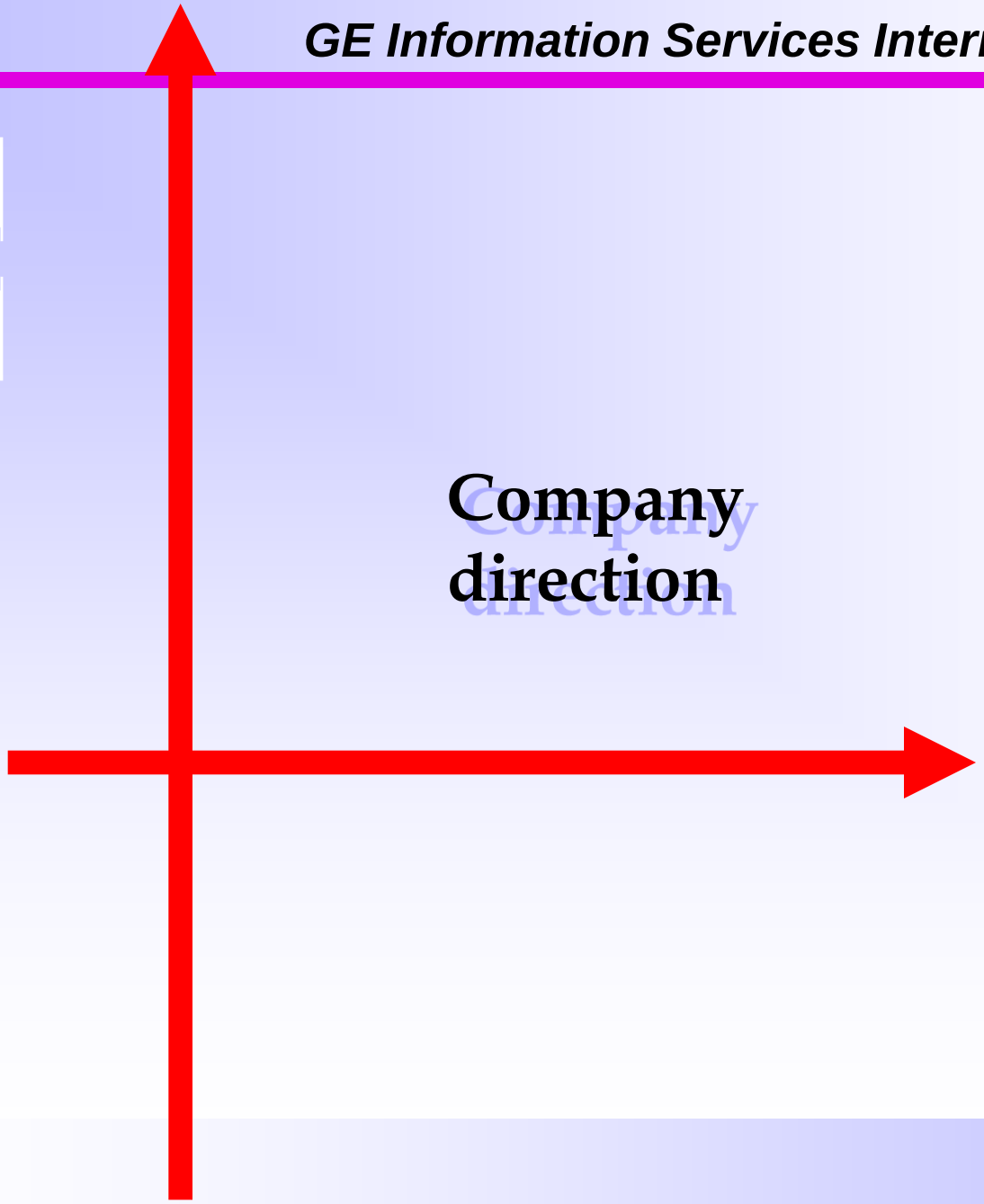
NSC=Network Service Center

- Ensure uninterrupted service and good service quality
- Work with (local) Sales & Network Planning to determine requirements & deploy technology
- Establish good contacts with PTT's/carriers to ensure good circuit quality and timely resolution of problems
- Work with local CSD and 2nd level support to collect evidence and/ or resolve Client access or stability problems

Geis Organization

NSC=Network Service Center

- Responsible for site search, lease negotiation,lease commitments
- Installation of sites (power, electricity,cooling,security)
- In-depth knowledge of regulatory issues, (International) circuit-routing exchange deployment, pricing structure
- Knowledge of market situation, competition, offerings
- Pre-Sales consultancy (when required)
- (PTT) invoice verification


Company
direction

Geis offering:

Business Productivity Solutions

based on Electronic Commerce

Intercompany Business Processes

- Logistics Management
- Supplier Management
- Channel Management
- Cash Management
- Inventory Control

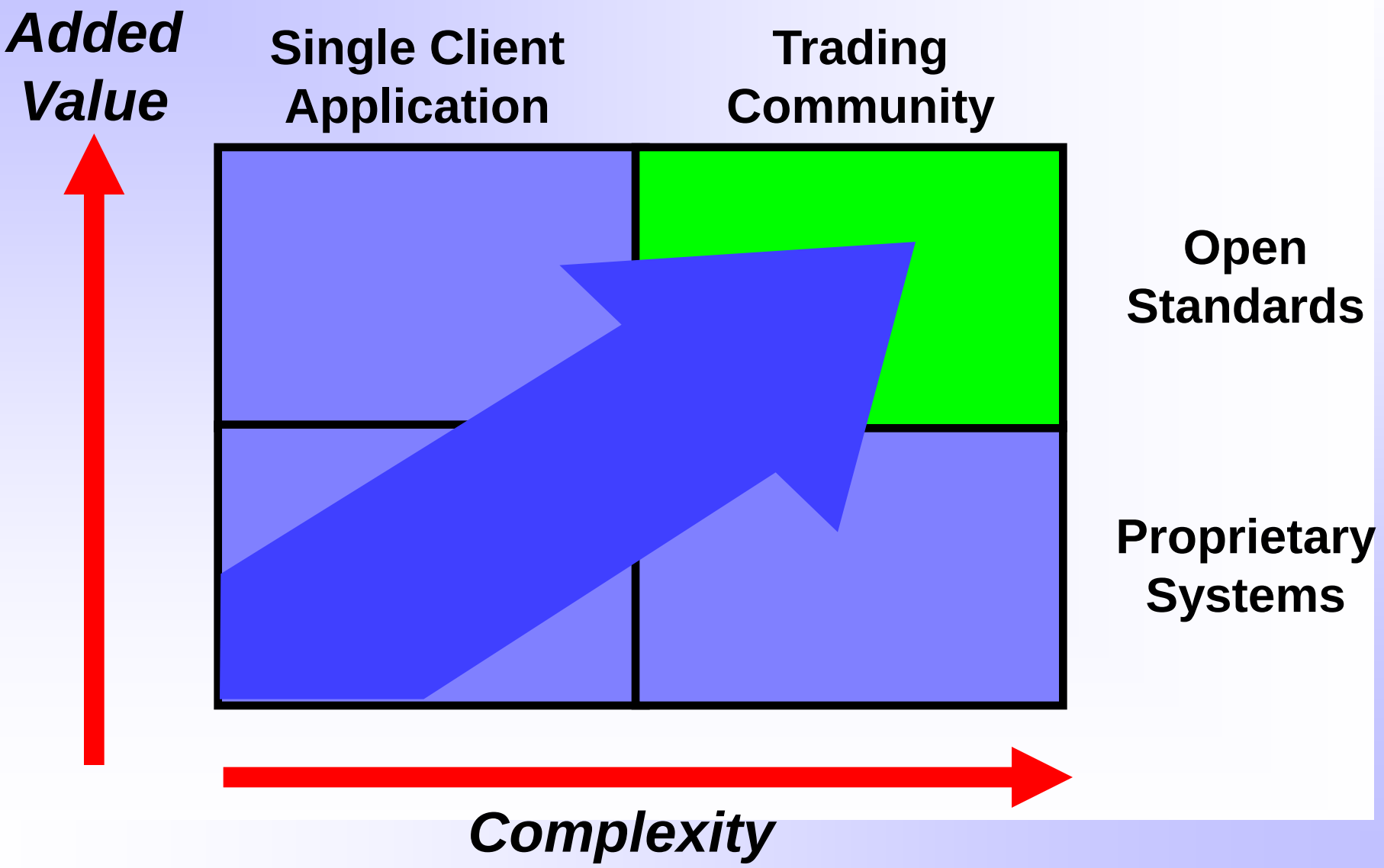
GEIS applications supporting the *Business Productivity Solutions*

- Electronic Product Catalogs
- Cross Docking
- Shipment tracking
- Vendor Managed Inventory
- Advanced Shipping Notification
- Competitive Intelligence
- Trading Communications
- Electronic Bidding
- Online Client Support
- Electronic Payment Services
- Channel Management
- Purchase Discounts
- EDI/ E-Mail
- Third Party Sources
- Information Manager
- Directory Services

Client Benefits

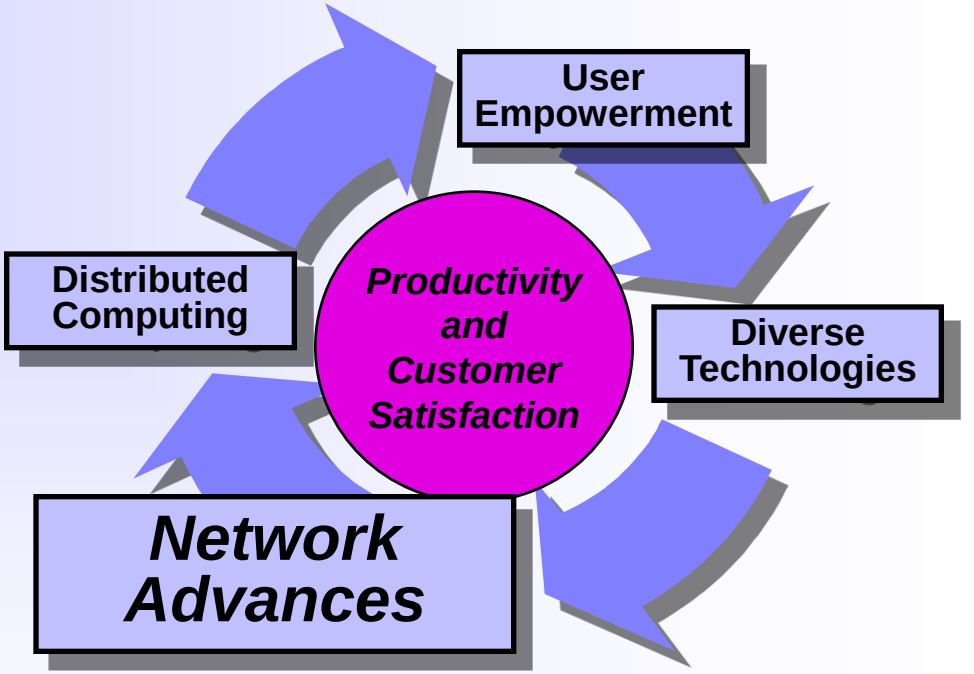
- Reduced cost & effort
- Increased speed & agility in market
- Improved quality & customer satisfaction
- Simplified trading relationships

GEIS Business Direction



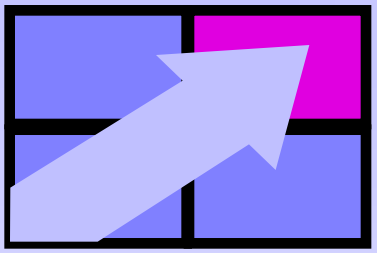
Information Technology Drivers for the ’90s

- Advanced technology – Compression, frame relay, cell relay
- Increased capacity and availability
- Remote/wireless technologies increase application usage
- Fiber being deployed around the world



Technology is Available Now For New Applications

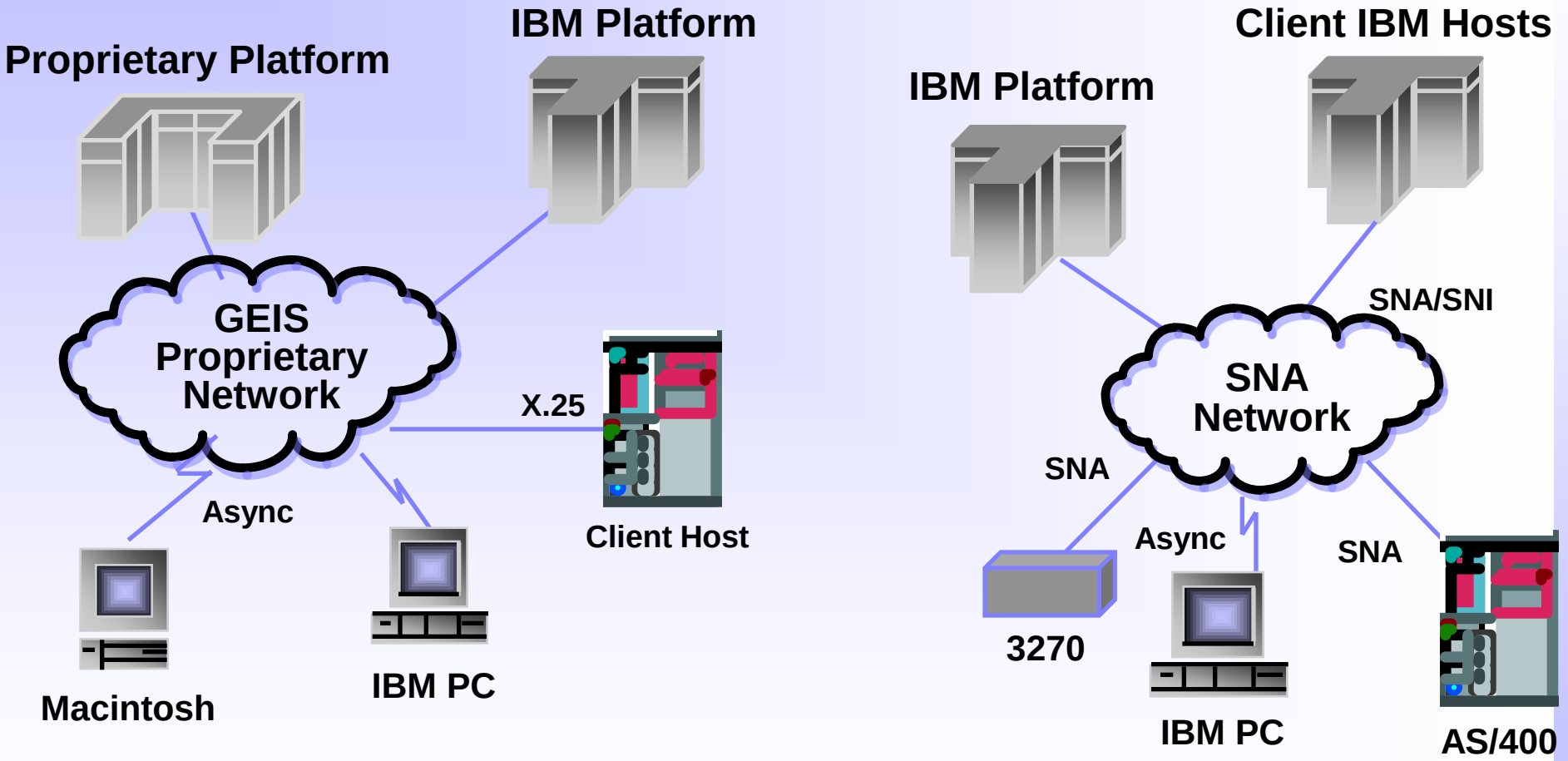
Technology Direction for the '90s



Three Point Program

1. Adopt open systems standards
2. Introduce next generation delivery system
3. Deliver integrated messaging engine in distributed environment

Technology Strategy – Where We Started

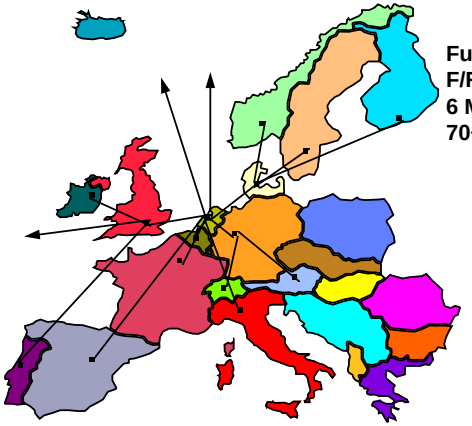


GEIS Delivery System For The ’80s

GEIS' Networks

Overview of Old Network Situation

European Proprietary Network



Fully Redundant
F/R Switching Core
6 Manned sites
70+ Unmanned sites

1

European SNA Network

SNA
Network
Fully Redundant

1

European High-Speed X.25 Network

HPN-X.25
Network
128 Kb Backbone
Leased circuits
& Frame-Relay
Worldwide 22 cities
Dial-up roll-out
Local access Target
for '95 is 200+ Cities

1

European GTN Network

Router Based
Multi protocol
Leased Lines
TCP/IP dial-up
(through HPN-X.25)
ISDN back-up
250+ routers Y.E.95

1

Network Access Modes

Currently Four Access Networks using one Backbone:

Red*Net (multi-protocol)

X3,X25,X75,X200,X400,X500
FTAM,FTP standards

Blue*Net (SNA)

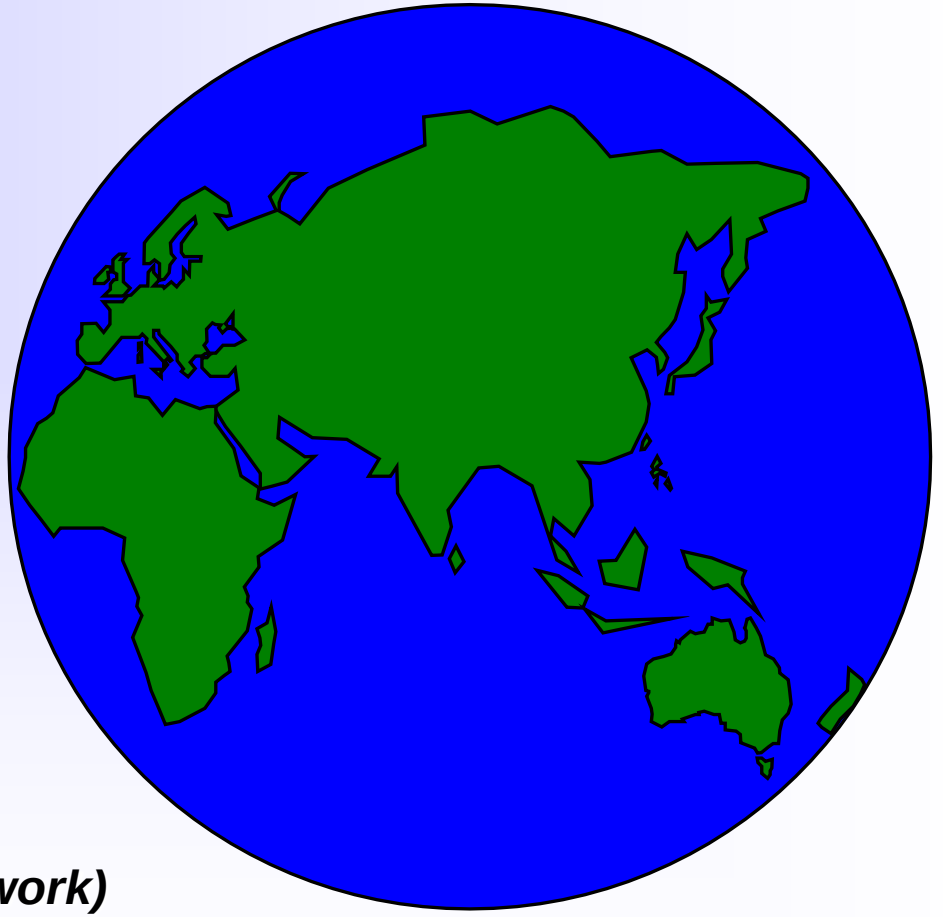
3270,3770,3780,LU6.2,APPC,APPN,
T2.1,NDM,RSCS,NCCF/NETVIEW
standards

H.P.N . (high-speed X.25)

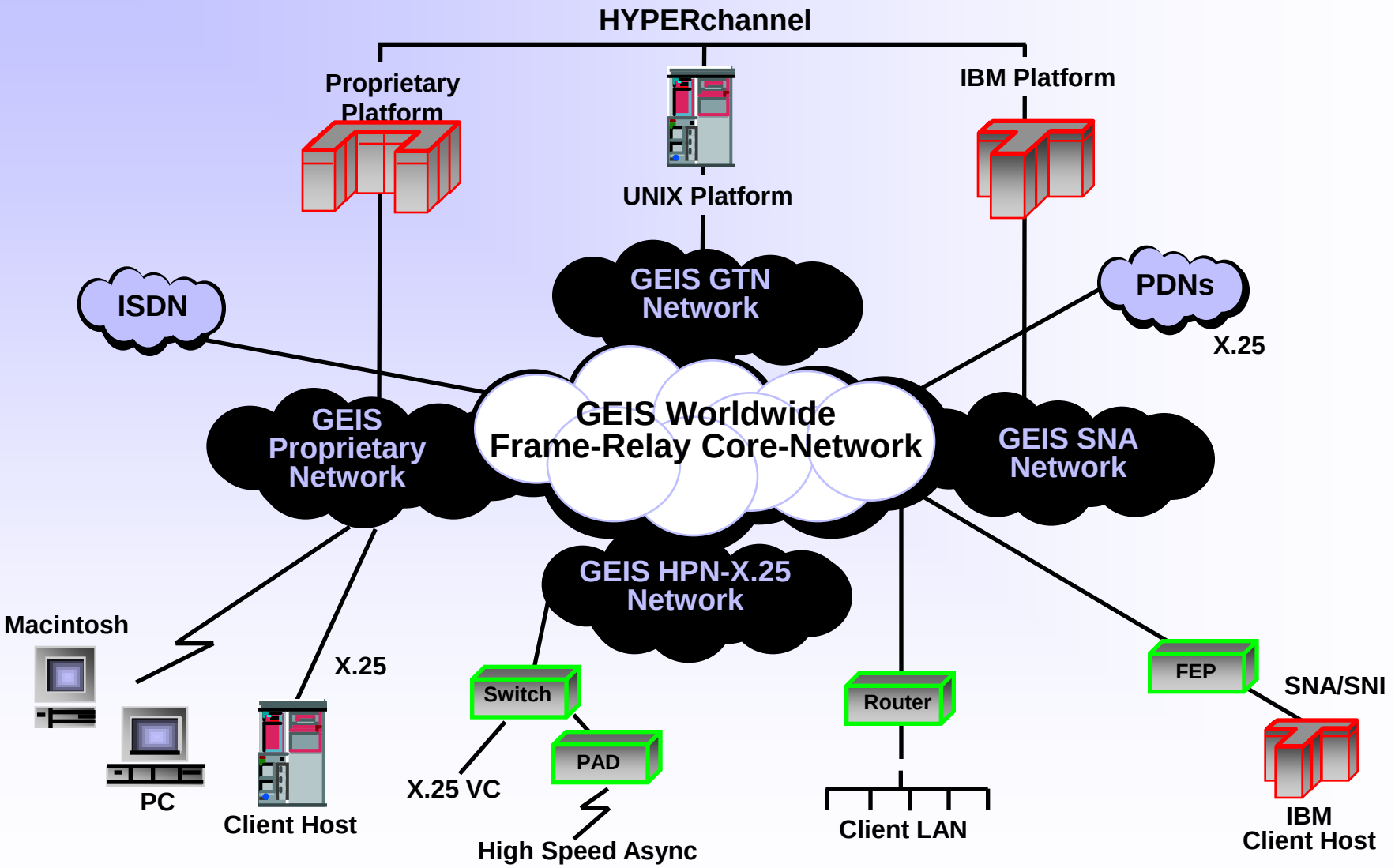
Standard X.25 based (Telematics)

GTN (Global Telecommunication Network)

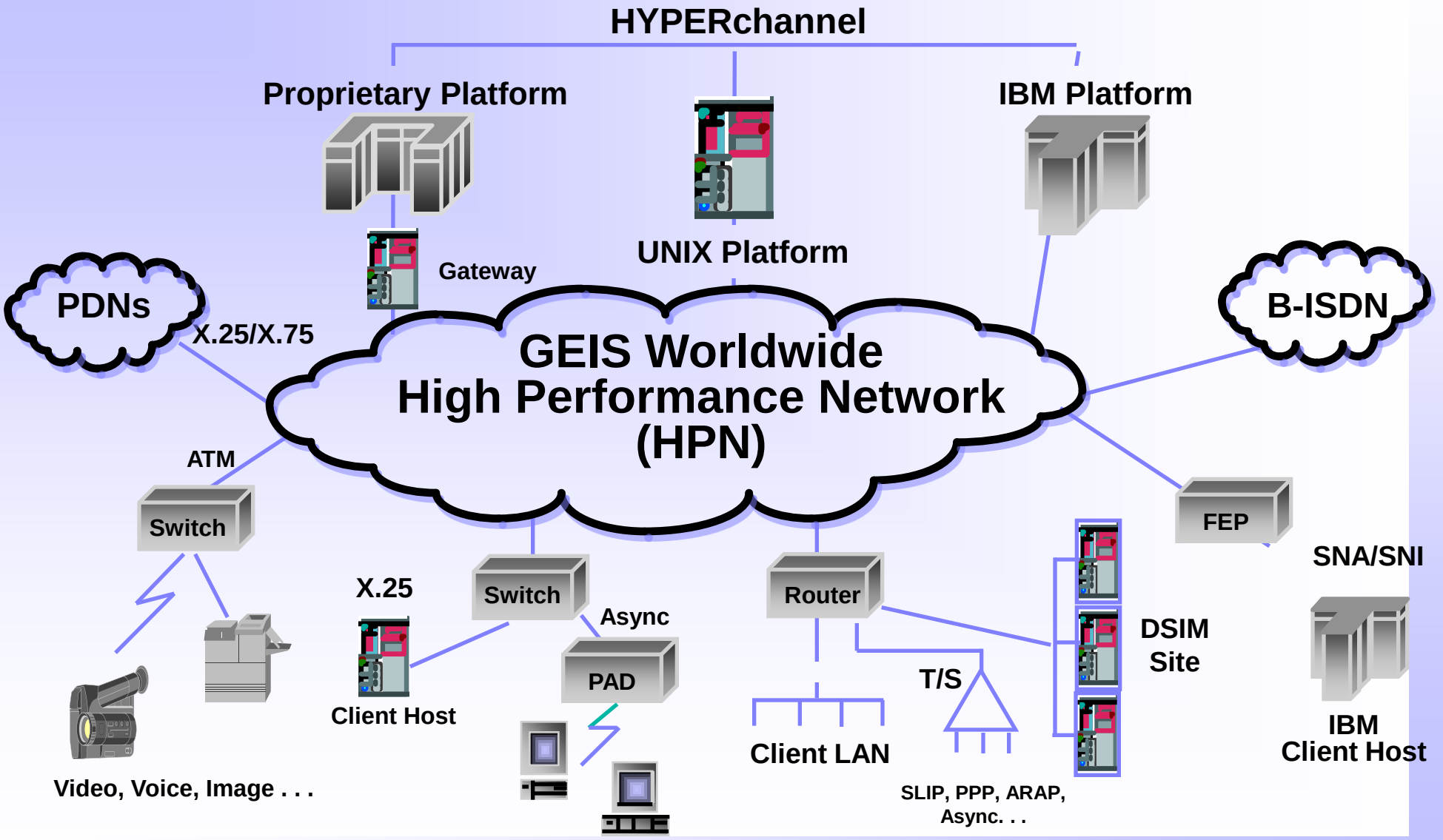
Multiprotocol High Speed Router Based
(=Global*Lan or HPN*LAN)



Technology Strategy – Where We Are Now



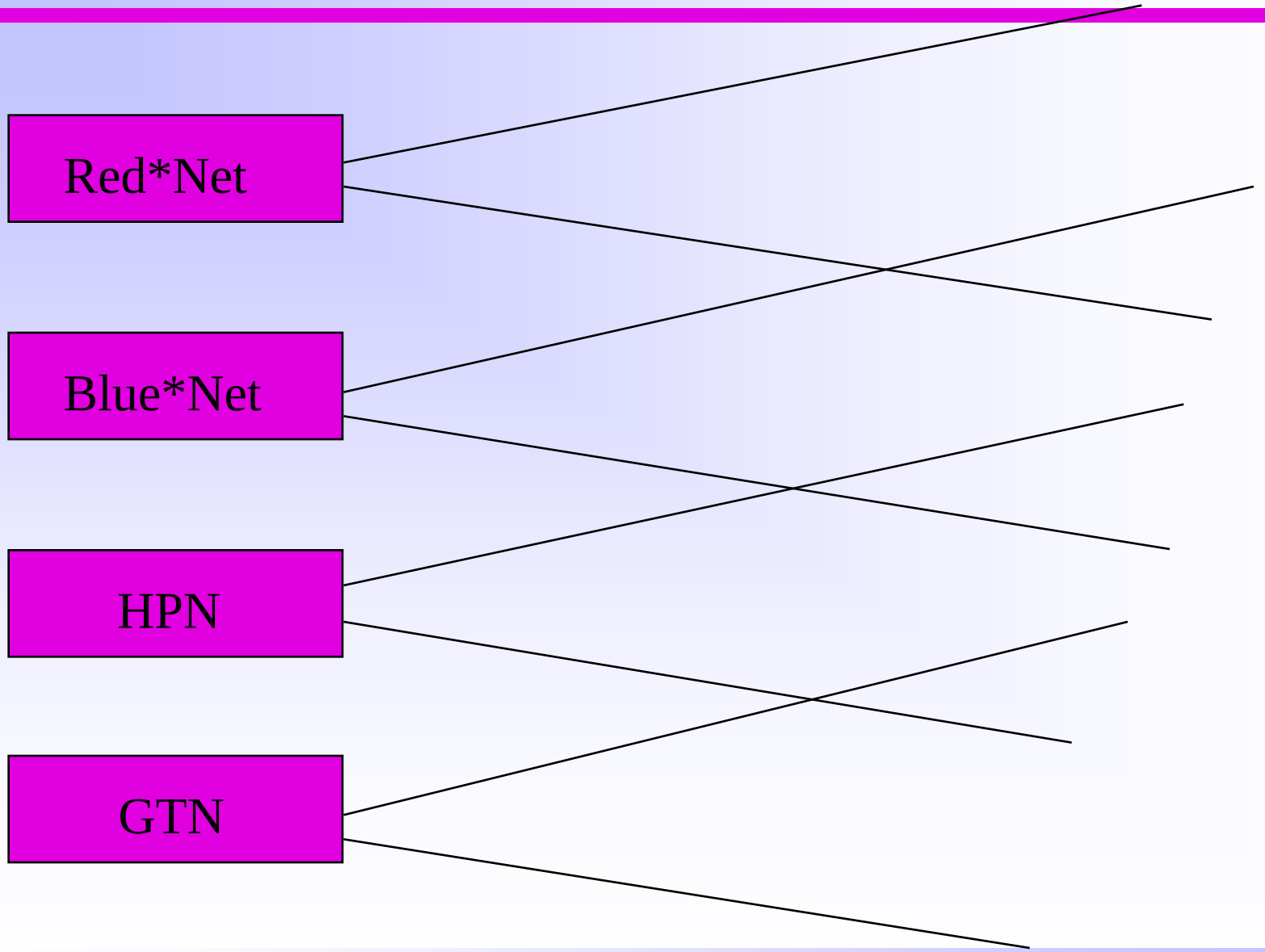
Technology Strategy: Final (1996 - Beyond)



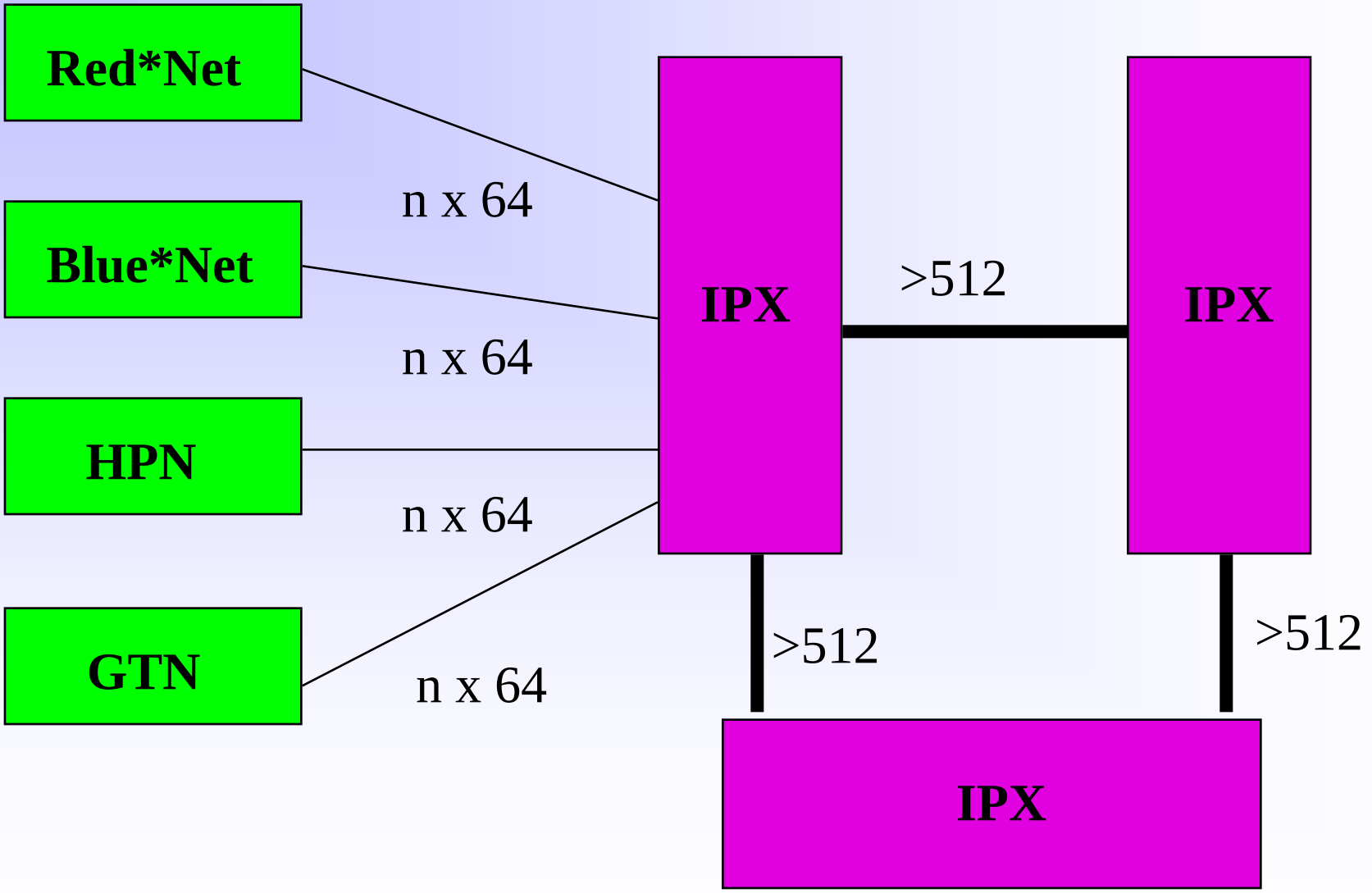
Complete Integration and Evolution to Multimedia

Consolidated Backbone

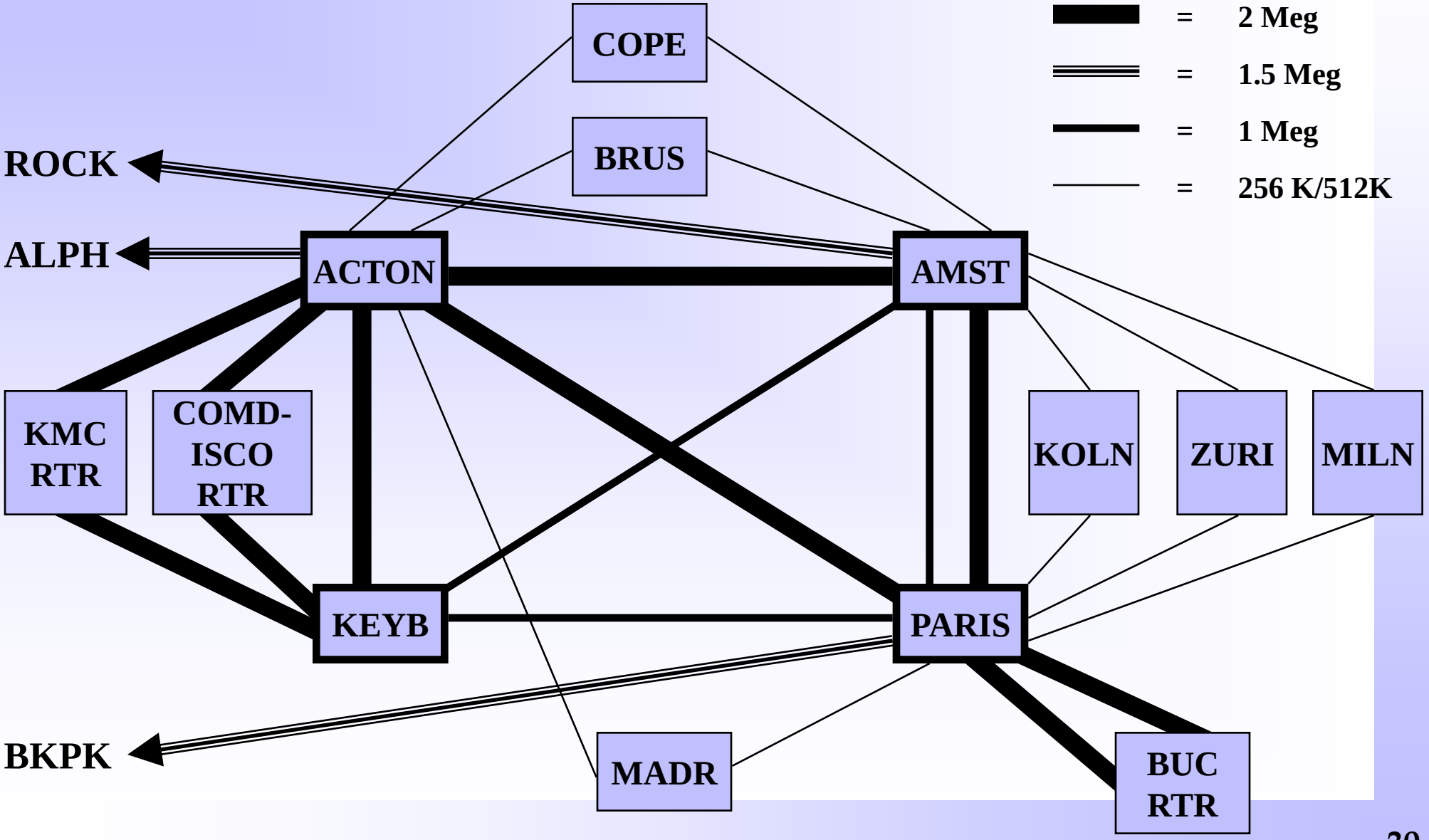
Old Networks Access Paths



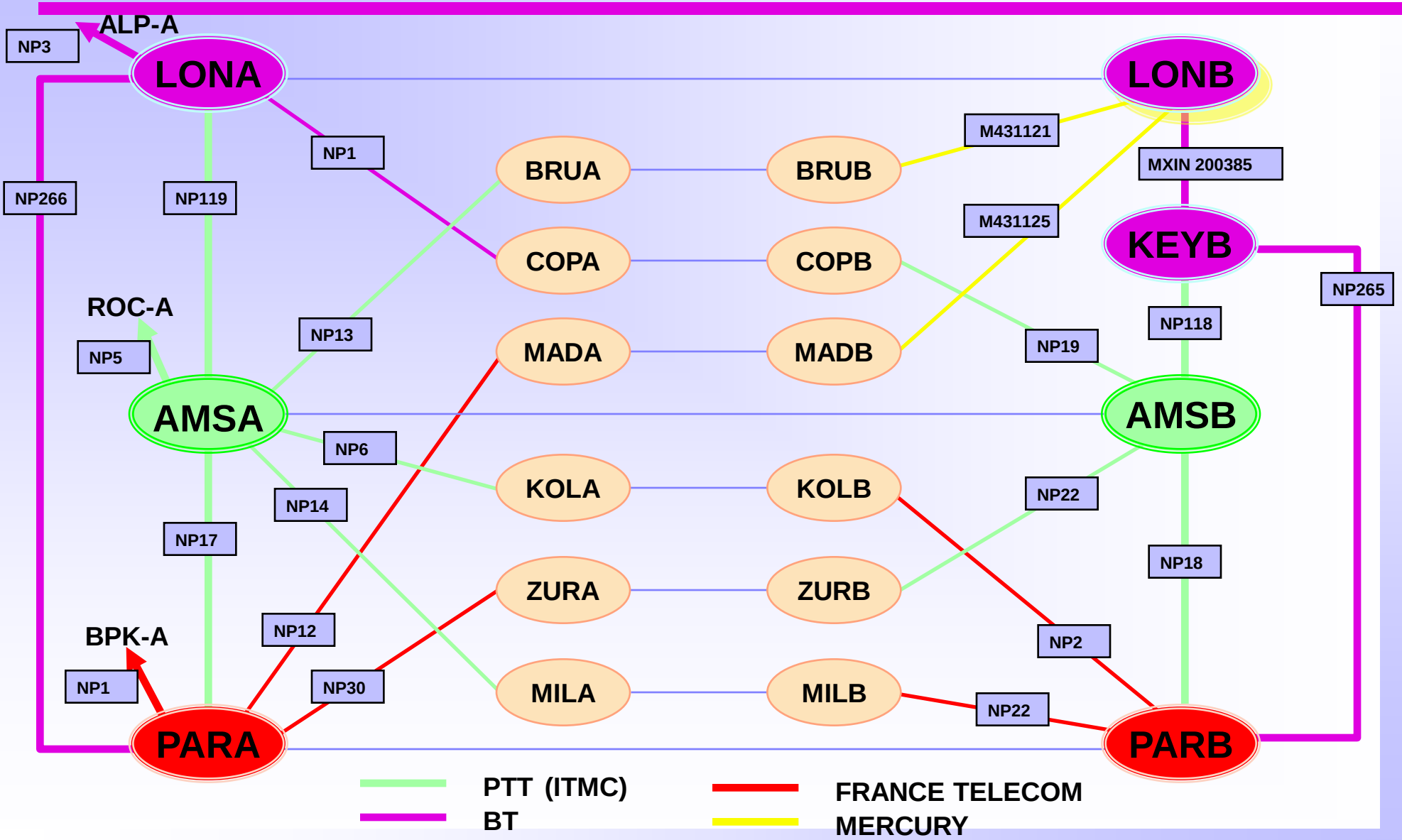
Current Networks Access Paths



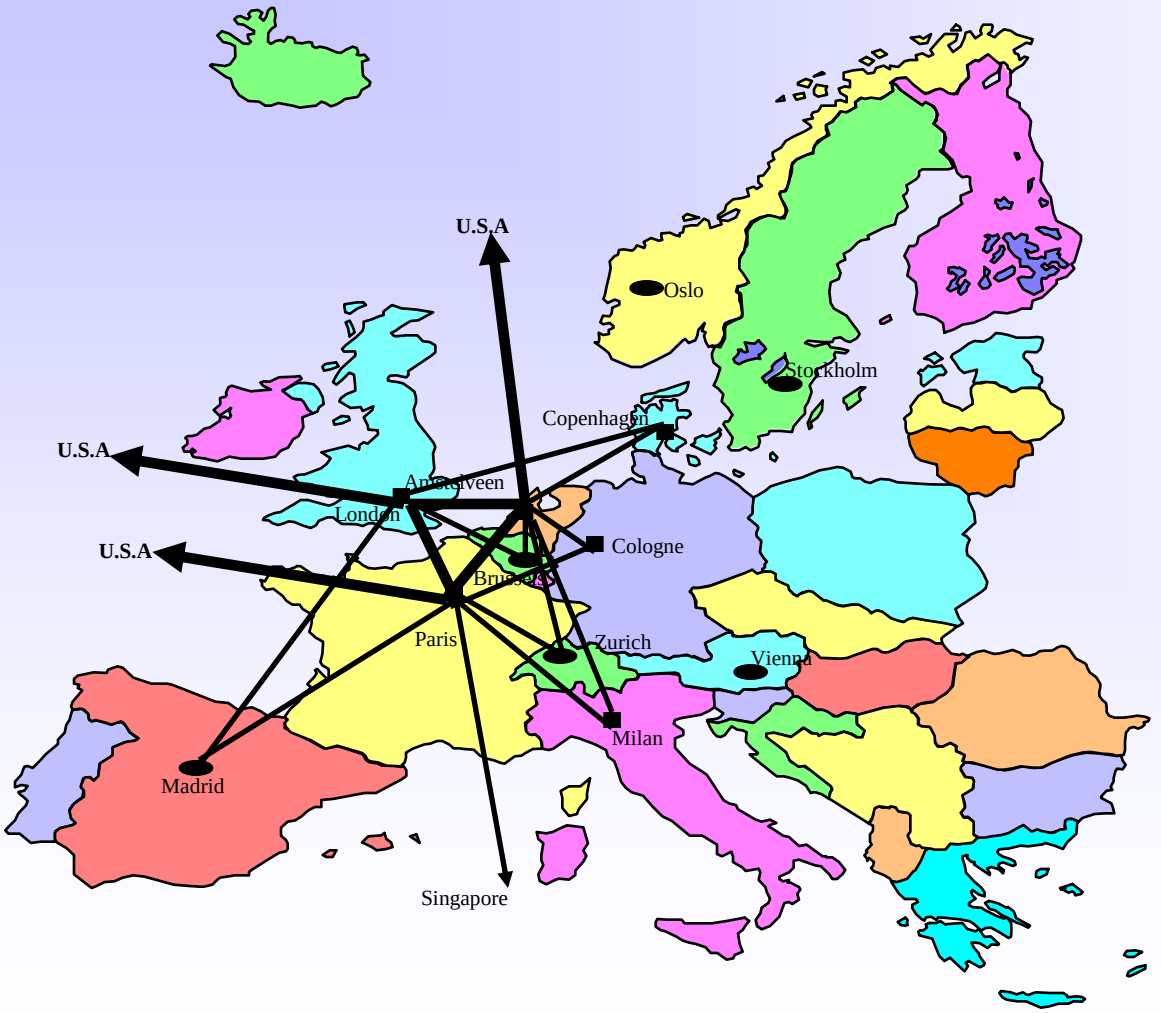
European IPX Network Configuration



European IPX Network Redundancy



European Core Frame-Relay Network



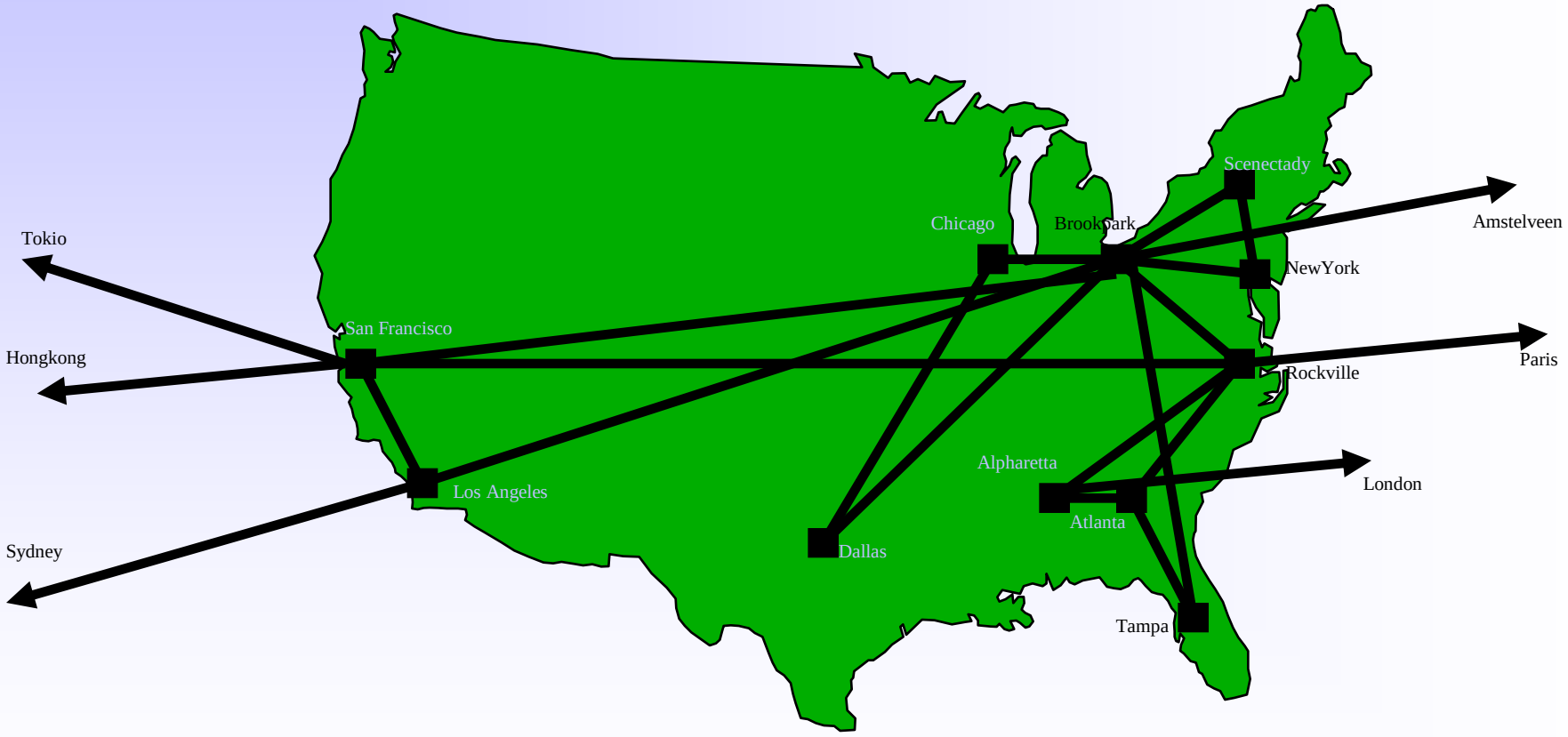
= 256/512 KB

= 2Mb

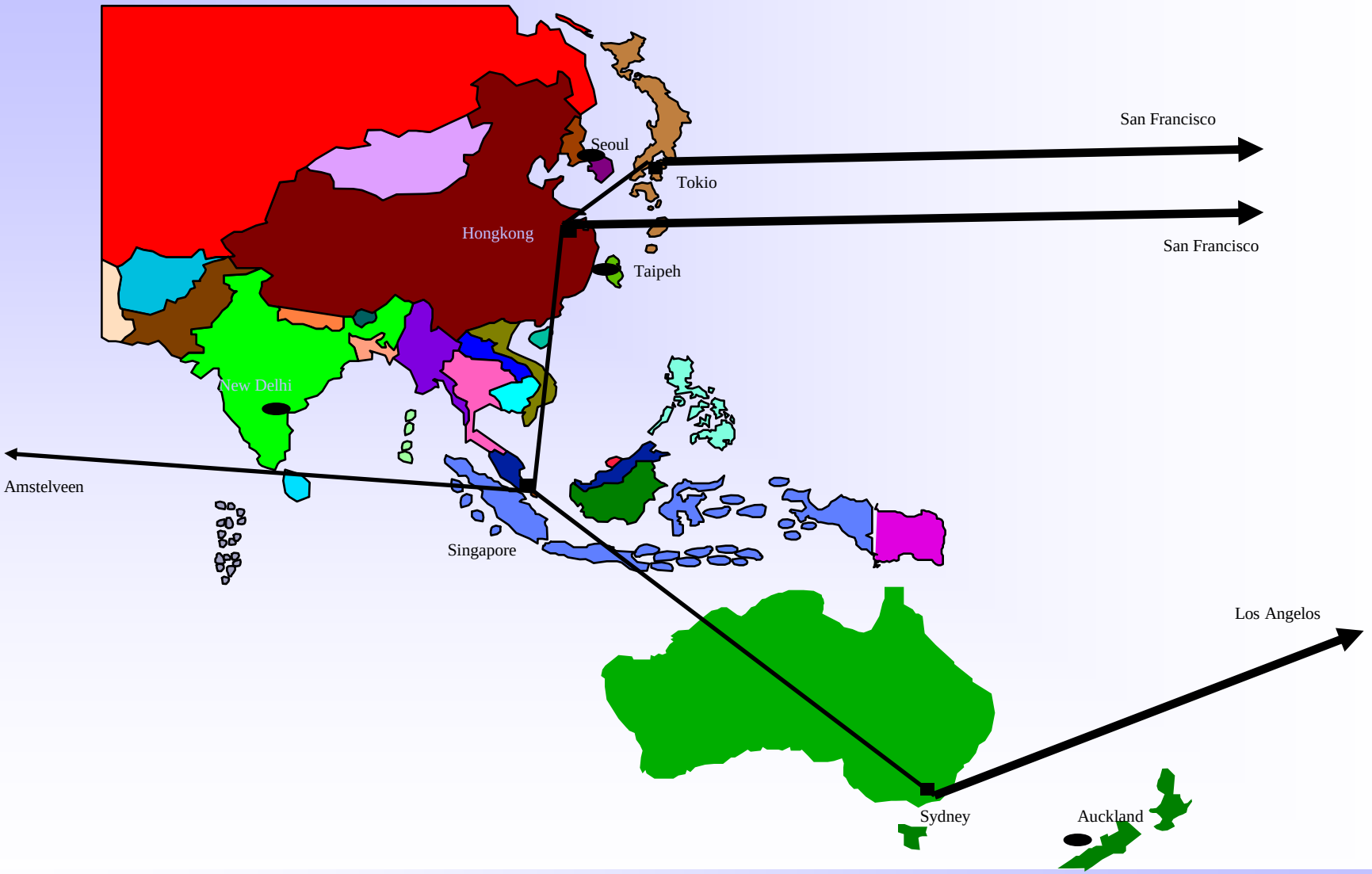
= Manned Sites

= Unmanned Sites

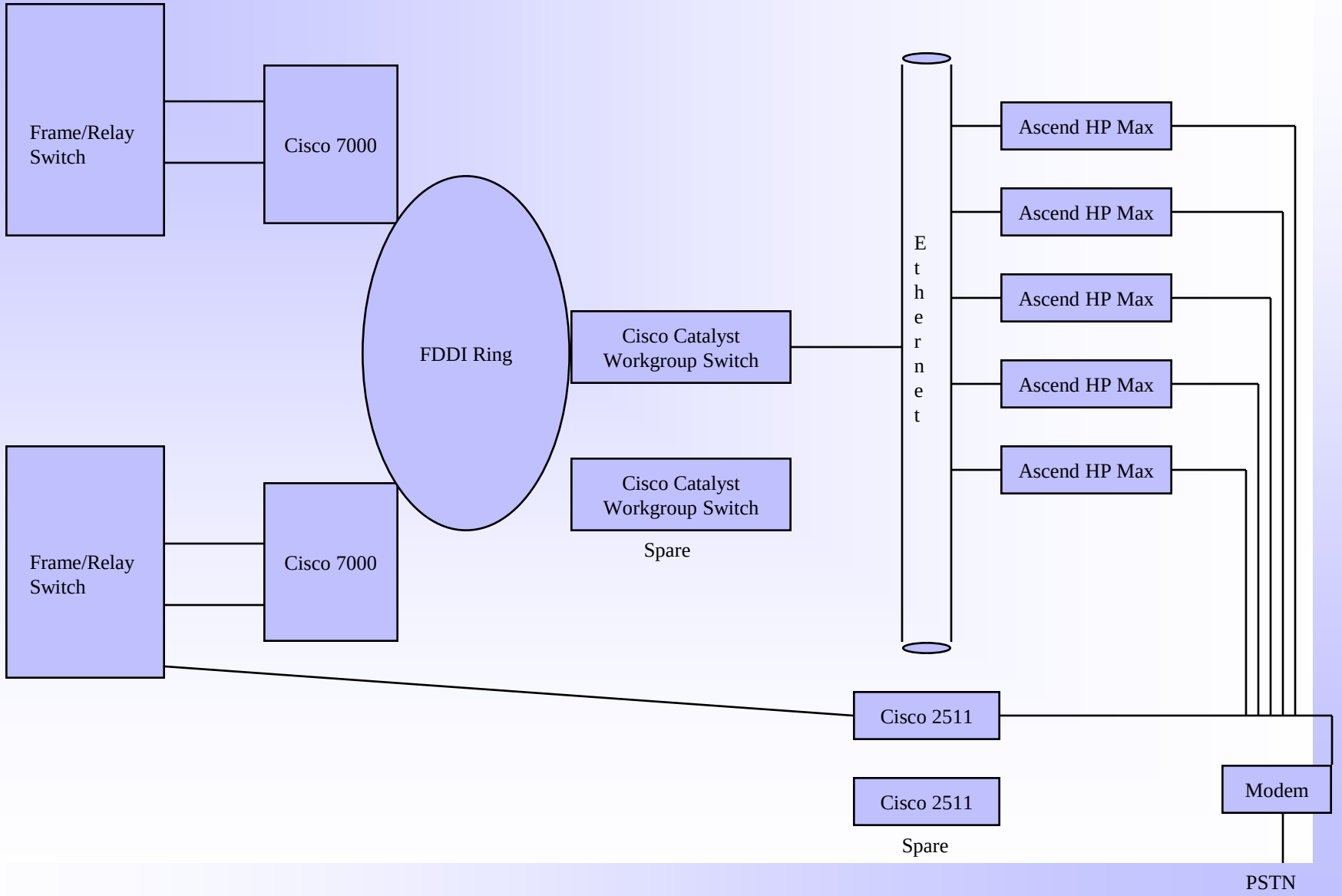
United States Core Frame-Relay Network



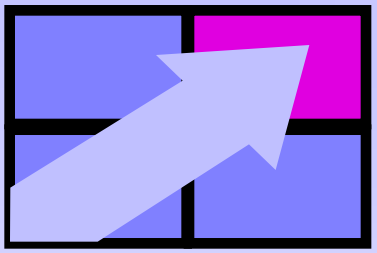
Asia-Pacific Core Frame-Relay Network



Client direct Frame-Relay connection



Technology Direction for the ’90s

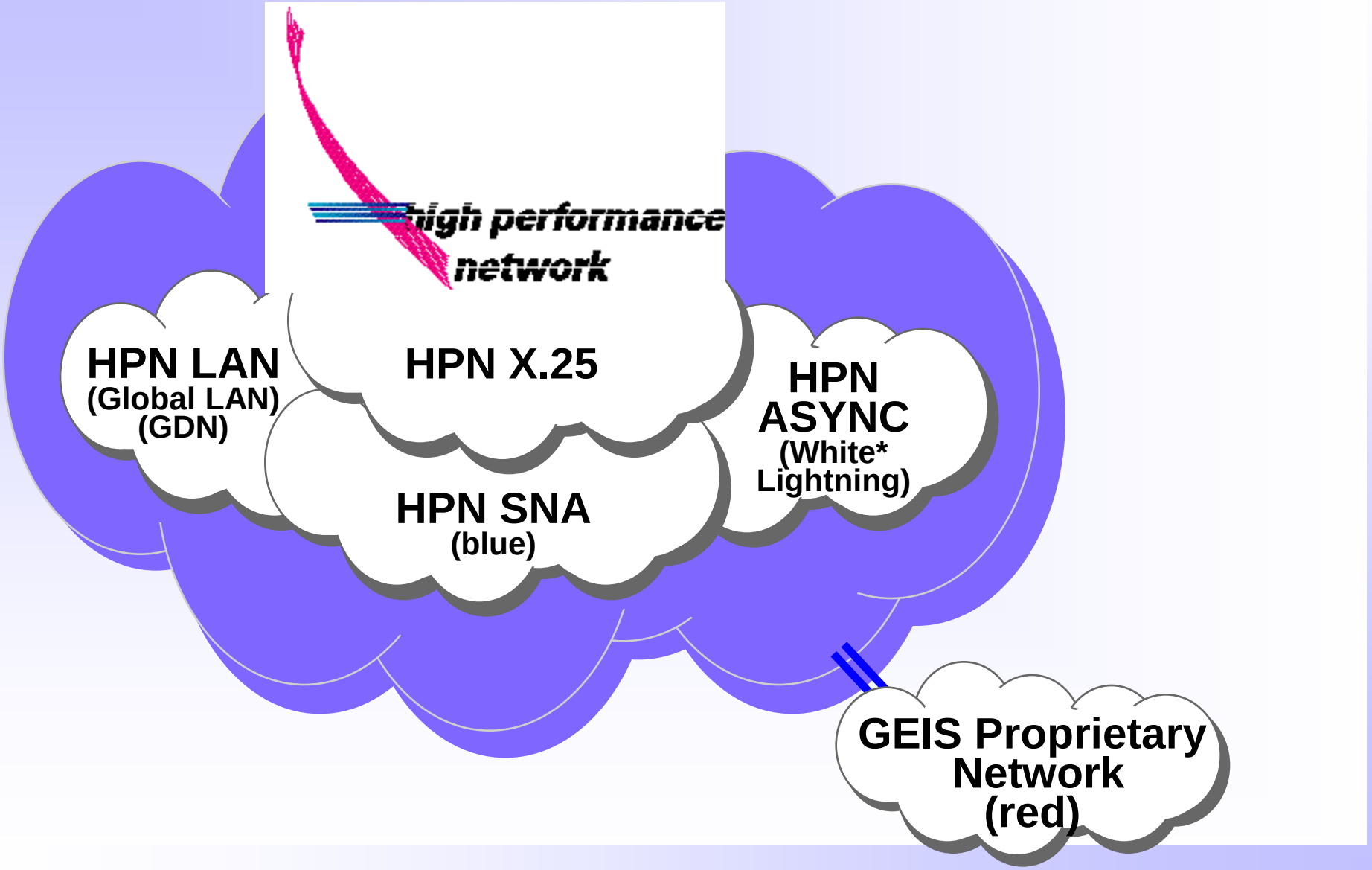


Introduce Next Generation Delivery Systems

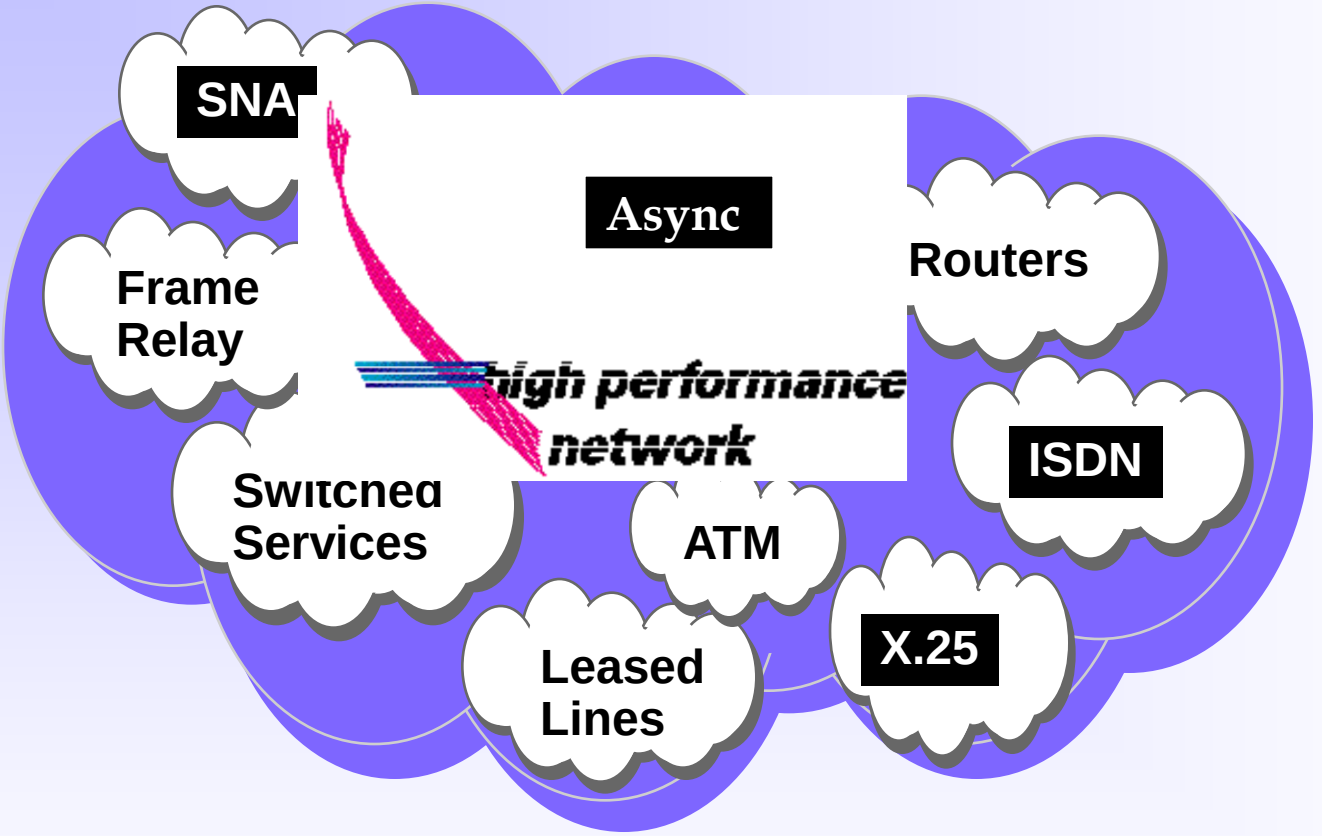
- **High Performance Network**
  - **Frame relay/cell relay & Highspeed X.25**
  - **LAN interconnectivity**
  - **Multimedia applications**
- **Global Telecommunications Network**
  - **Router based**
  - **(dial) TCP/IP**
  - **ISDN**

Speed: Information Delivered Within Time-Critical Windows

What is the HPN ?



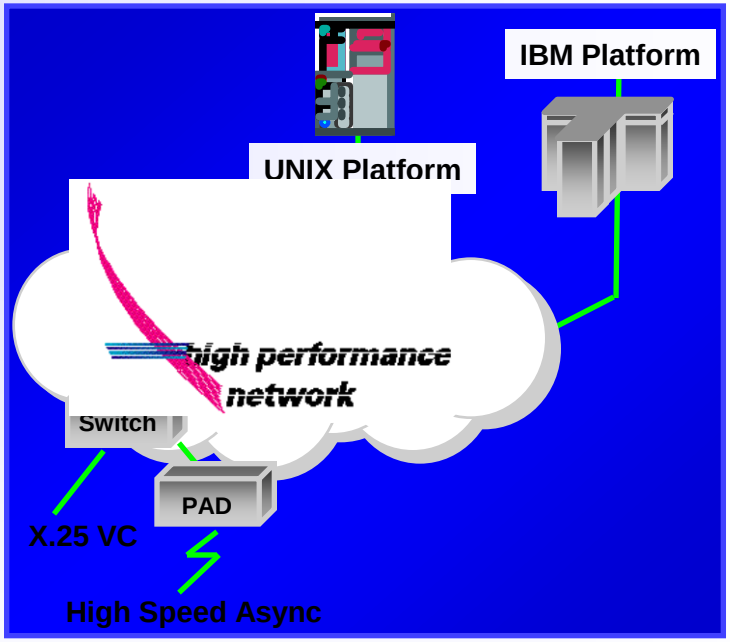
High Performance Network Technologies



Utilizes transport and distribution technology that meets business requirements for cost, quality and performance for a given geographical location

HPN Async and X.25 Connectivity

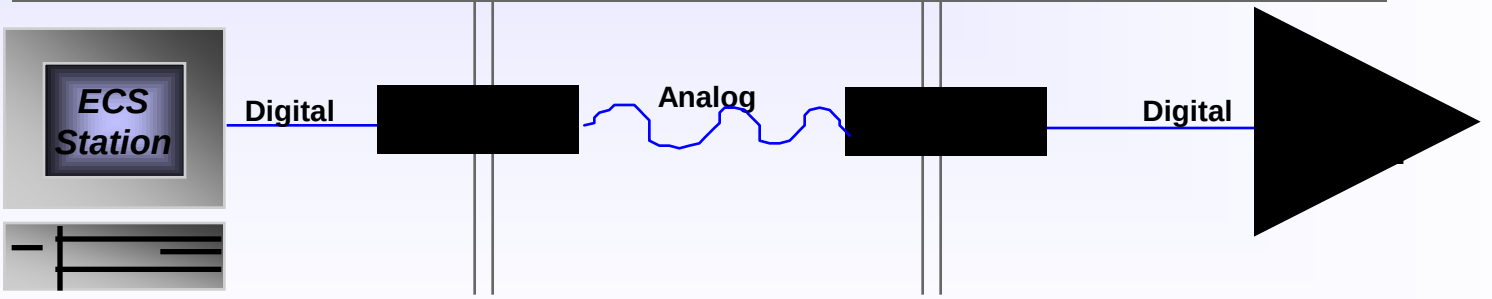
- A Telematics-based X.25 network
  - Highly meshed frame relay backbone
- Host access from 64 Kbps
- Terminal access 9.6 Kps -28.8 Kbps
- Standard X.3 PAD functions
- Commercial since November ’93



Higher speeds, more standard, more flexibility for clients

HPN Async Connectivity

MODEM STANDARD		CIRCUIT SPEED	Compressed MAX THROUGHPUT (MNP/V.42)
V.32	=	9600 bps	38.4 Kbps
V.32 bis	=	14,400 bps	57.6 Kbps
V.34	=	28,800 bps	115.2 Kbps

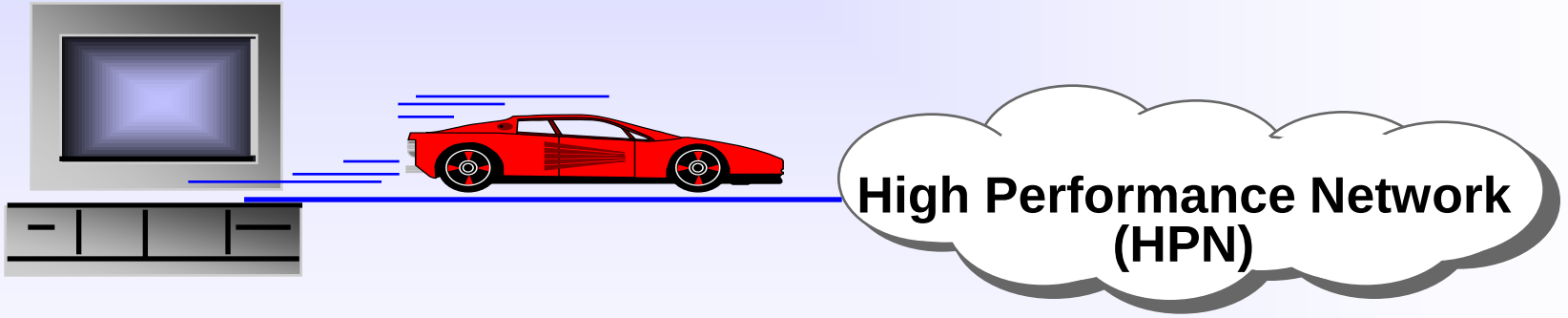


Higher speeds support time critical applications

HPN Async Connectivity

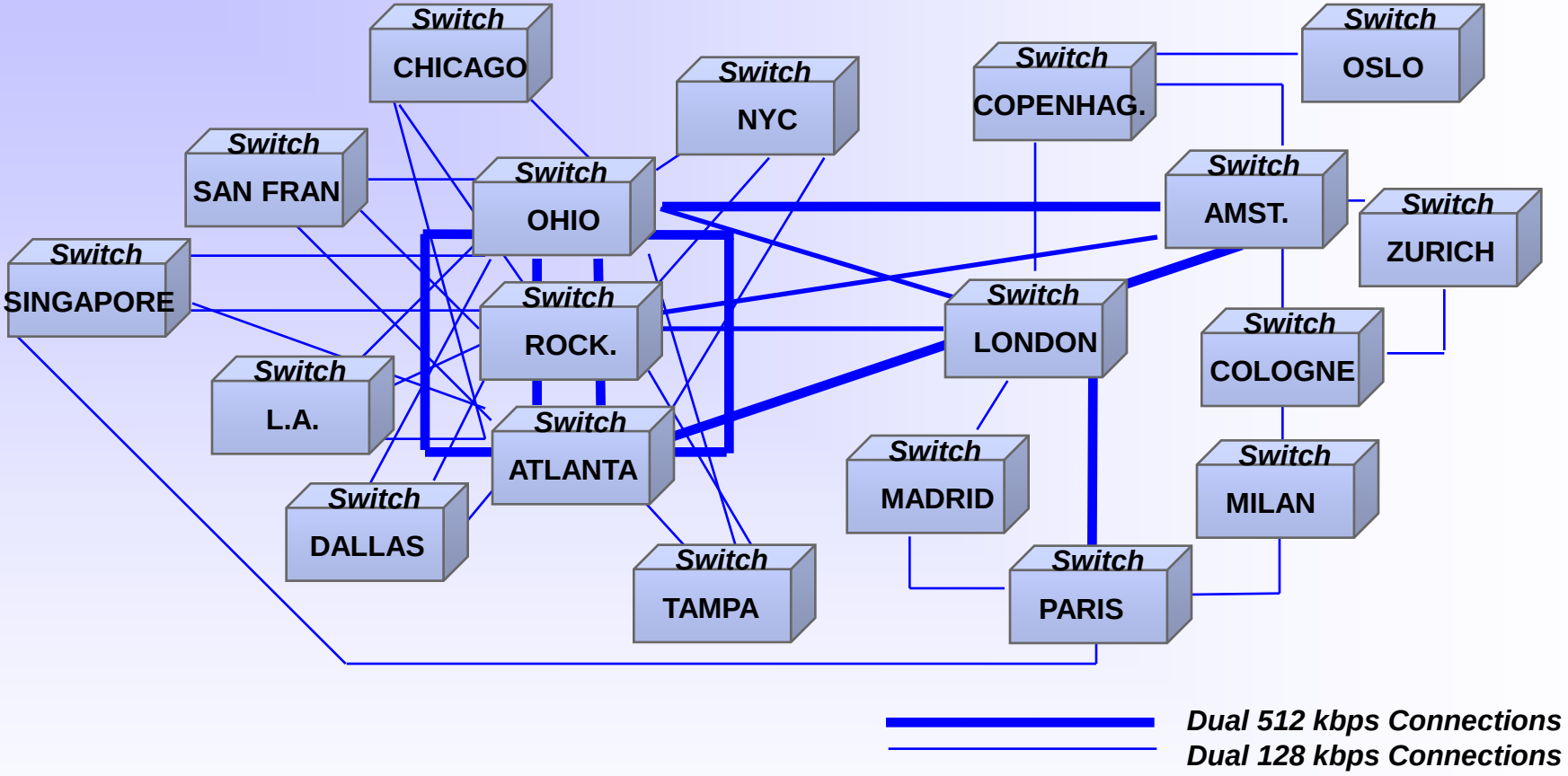
To Fully Leverage HPN Async Capabilities

- **GEIS HPN Async presently architected for throughput speeds up to 38.4 Kbps (via ISDN)**
- **Understand your desktop environment**
- **If problems are encountered, turn off compression and/or drop modem speed.**



When all components are properly configured, HPN Async speeds can be achieved !

HPN Async and X.25



Additional Nodes as Demand Grows

(Highly Meshed Frame Relay Back-Bone)

HPN Async Access Points N.America

City	State	City	State	City	State
Atlanta	GA	Houston	TX	Philadelphia	PA
Baltimore	MD	Indianapolis	IN	Phoenix	AZ
Boston	MA	KansasCity	MO	Pittsburg	PA
Chicago	IL	LongBeach	CA	Portland	OR
Cincinnati	OH	Los Angeles	CA	Rockville	MD
Cleveland	OH	Miami	FL	SaltLakeCity	UT
Columbus	OH	Milwauki	WI	SanDiego	CA
Dallas	TX	Minneapolis	MN	SanFrancisco	CA
Denver	CO	Naperville	IL	Seattle	WA
Detroit	MI	NewYorkCity	NY	St.Louis	MO
Erie	PA	Oakland	CA	Sunnyvale	CA
GardenGrove	CA	Orlando	FL	Tampa	FL

HPN Async Access Points Europe

Germany

Cologne
Duesseldorf
Frankfurt
Hamburg
Hannover
Mannheim
Muenich
Nuernberg
Stuttgard
Bielefeld
Berlin
Chemnitz
Bremen
Dresden
Butzbach
Leipzig
Walldorf

United Kingdom

London
Birmingham
Glasgow
Guernsey
Jersey
Manchester
Reading
Southampton
Hitchin
Northampton
Glouchester
Loughborough
Horsham

Denmark

Copenhagen

Italy

Milan
Bologna
Roma
Padova
Firenze

Spain

Madrid
Barcelona

Portugal

Lisbon
Oporto

Switzerland

Geneva
Zuerich
Lausanne
Basel

Netherlands

Amstelveen
Zoetermeer

Finland

Helsinki
Tampere

Sweden

Stockholm
Gothenburg
Malmoe

Norway

Oslo
Stavanger

France

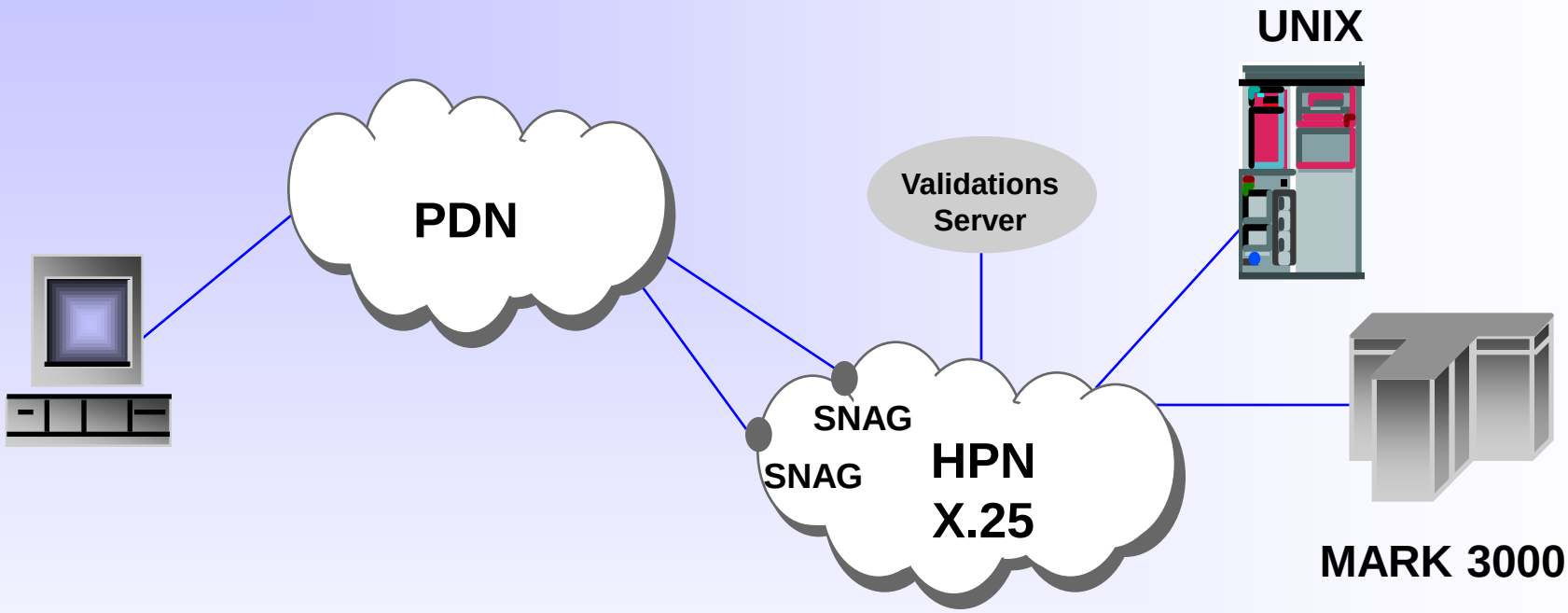
Paris

Belgium

Brussels

HPN Async and X.25 Connectivity

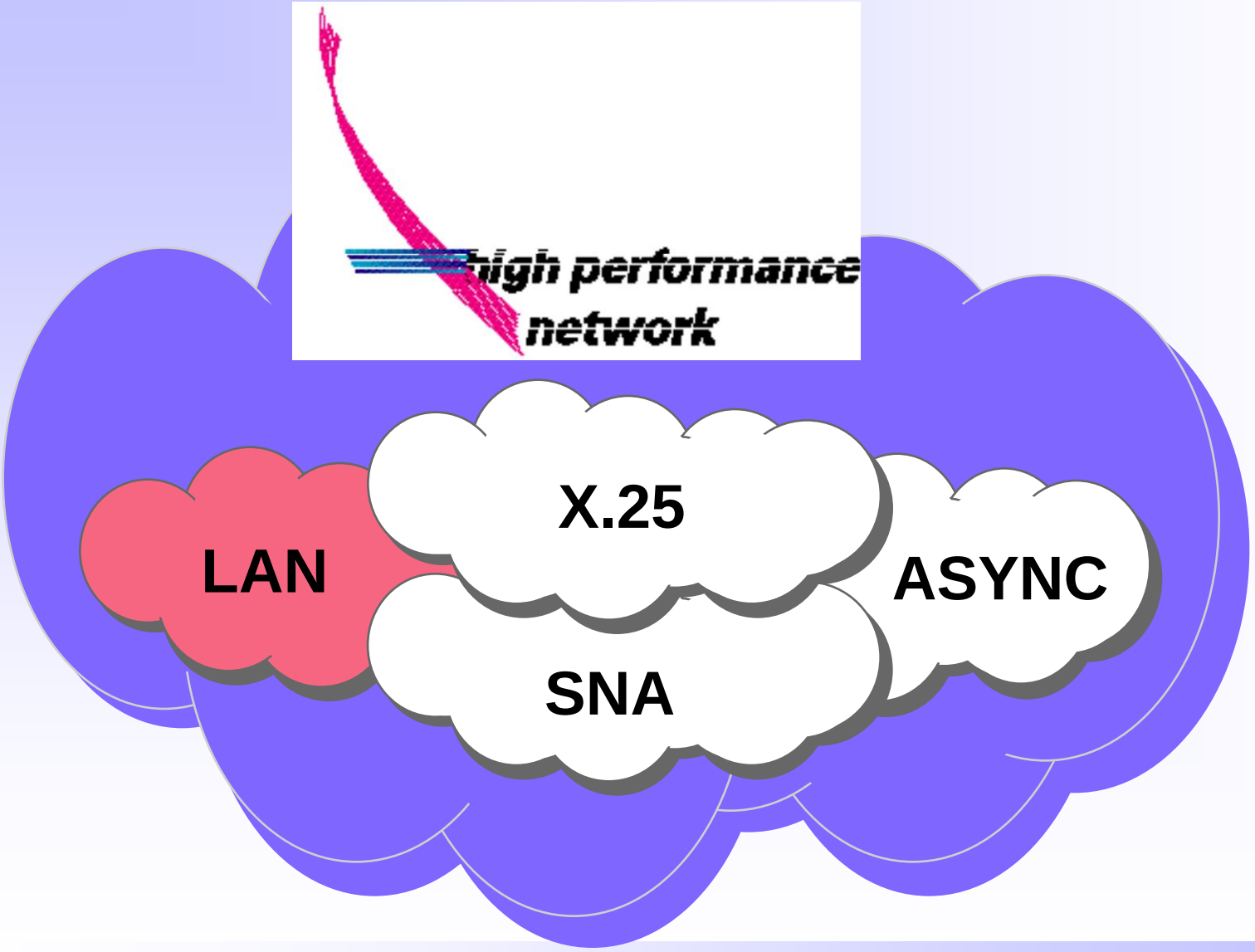
Public Data Network Access to HPN



Secure Network Access Gateway

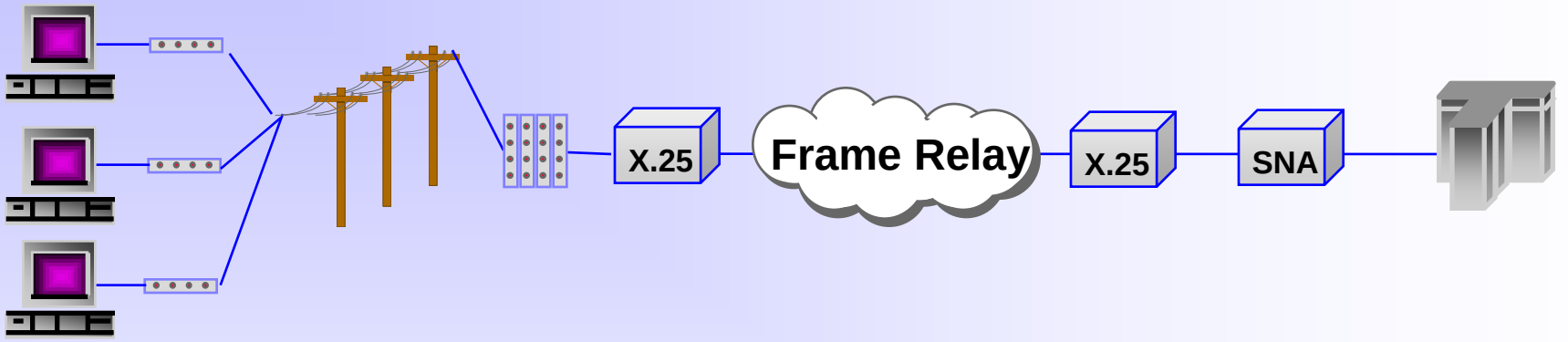
- **Software Application which provides HPN Access security for all users coming in via async ports and X.25**
- **Supports validations, routing and accounting record generation for each PDN session**
- **Planned for commercial availability in 2Q95**

HPN LAN

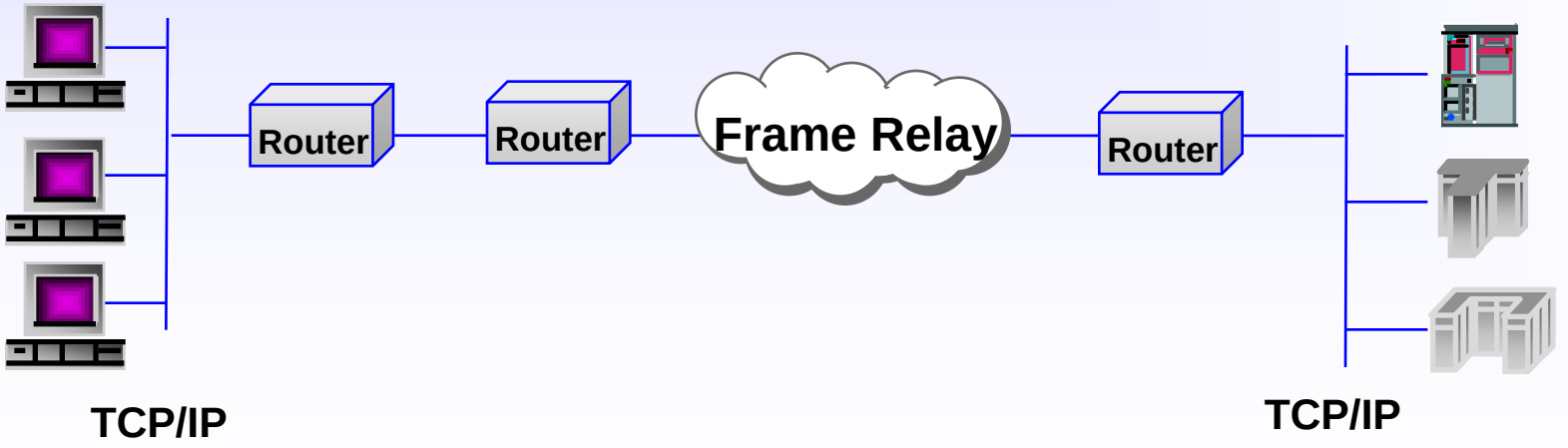


HPN Async Access versus HPN LAN Access

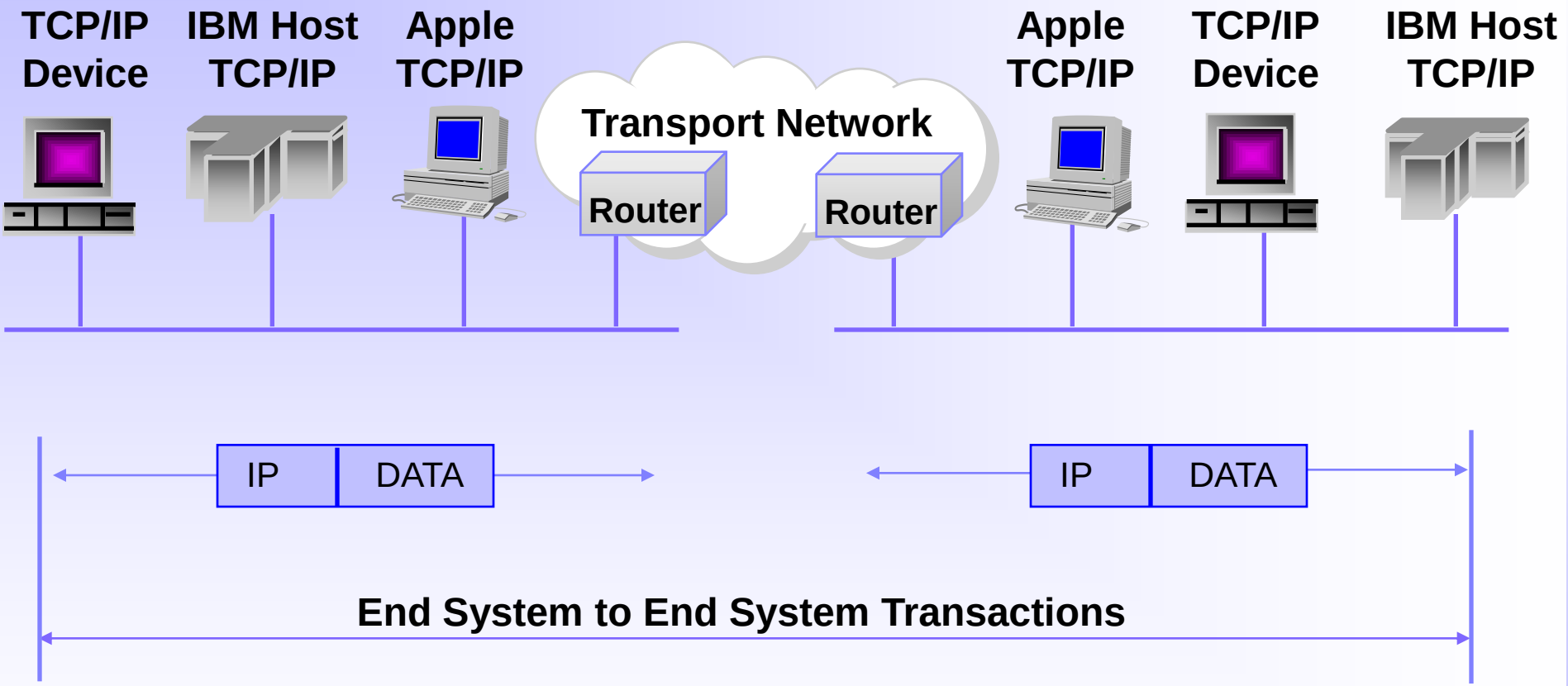
HPN Async access



HPN LAN access



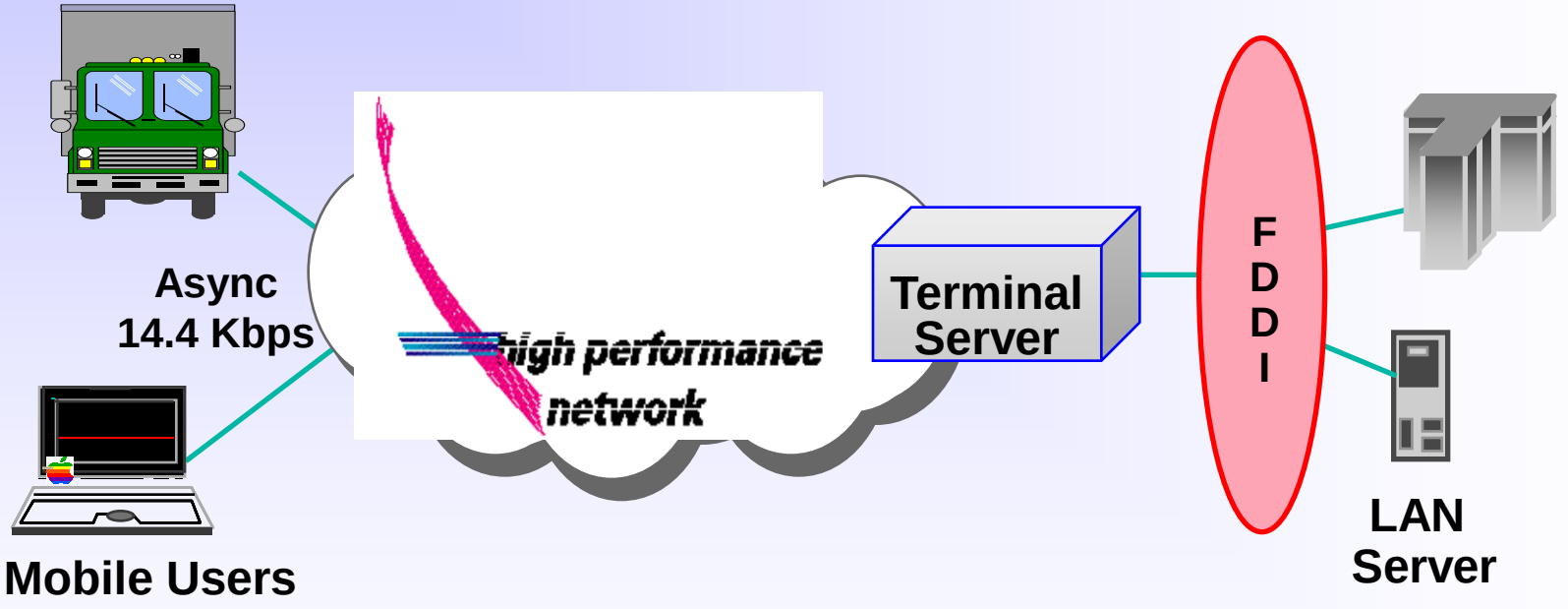
TCP/IP Connectivity



Remote LAN Access

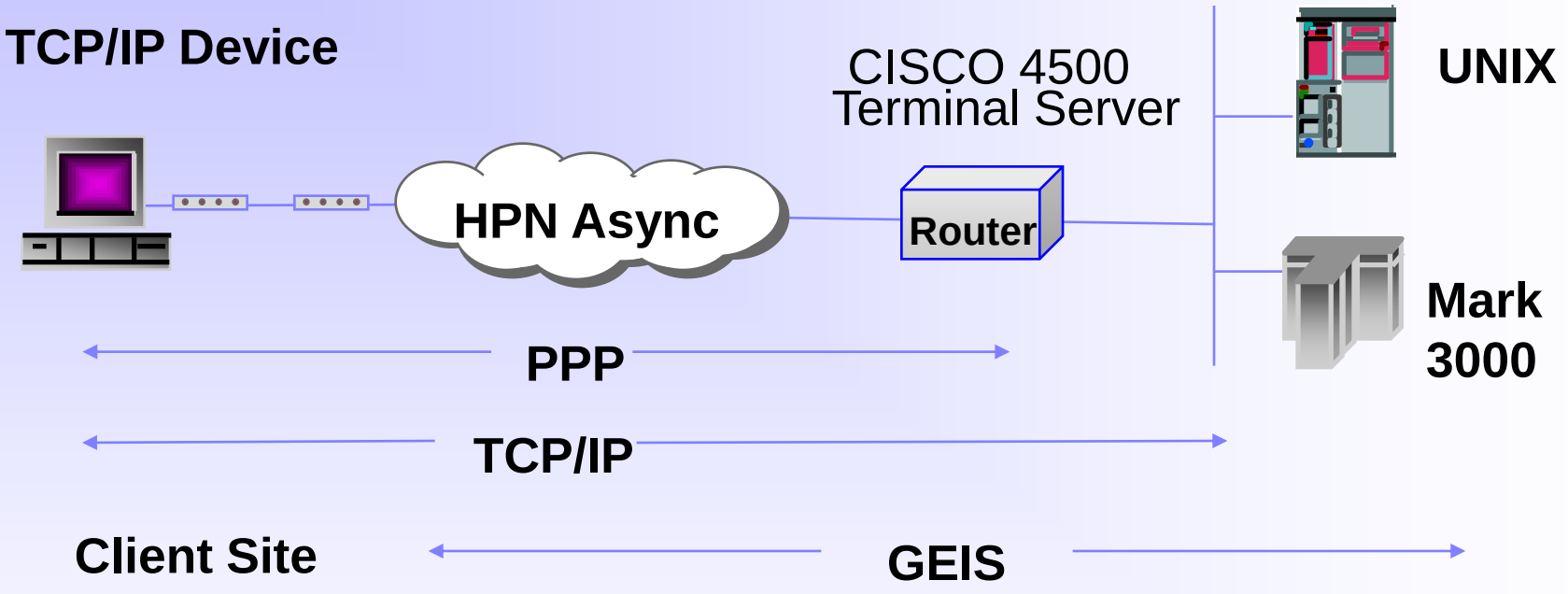
The Need: Many remote individual users need access to LAN based resources and applications as if they were in the office

Solution: Provide LAN network protocols over an Async Dial network



Extends LAN applications ...anywhere

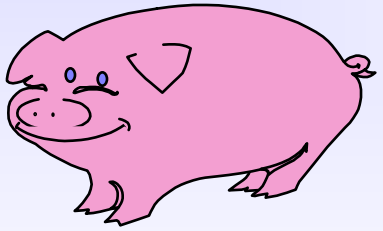
Dial TCP/IP Access



PPP = Point-to-Point Protocol

Remote LAN Access

- Requires Point-to-Point Protocol (PPP) software
  - TCP/IP and Novell - Windows ‘95, Shiva Remote, Klos Tech.
  - TCP/IP Only - Windows NT
- Same considerations as HPN Async
- Set user expectations; 14.4Kbps Async ≠ 10Mbps LAN
- Avoid screen exports =

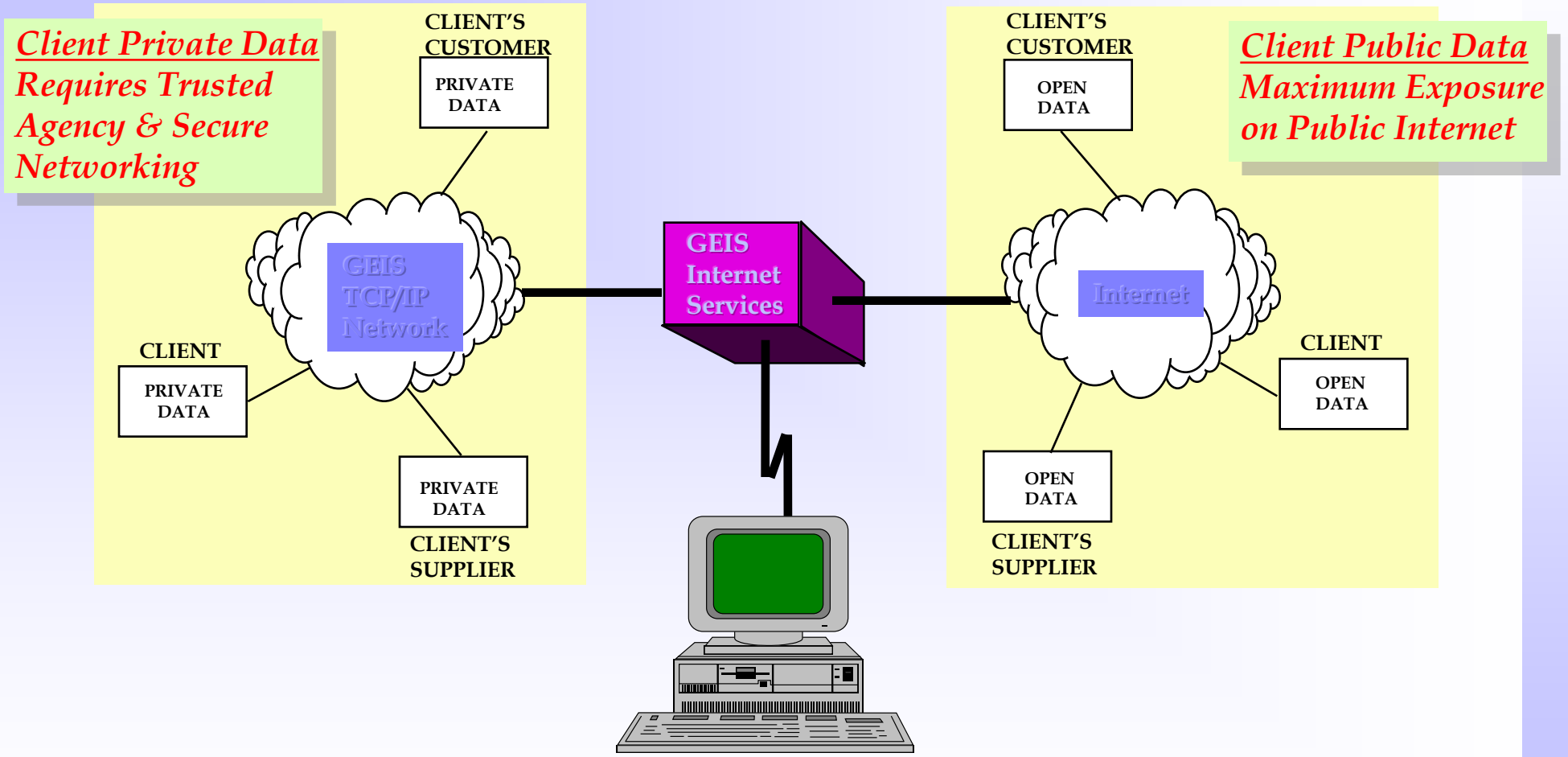


- Use distributed applications

Technology rapidly emerging

Internet??

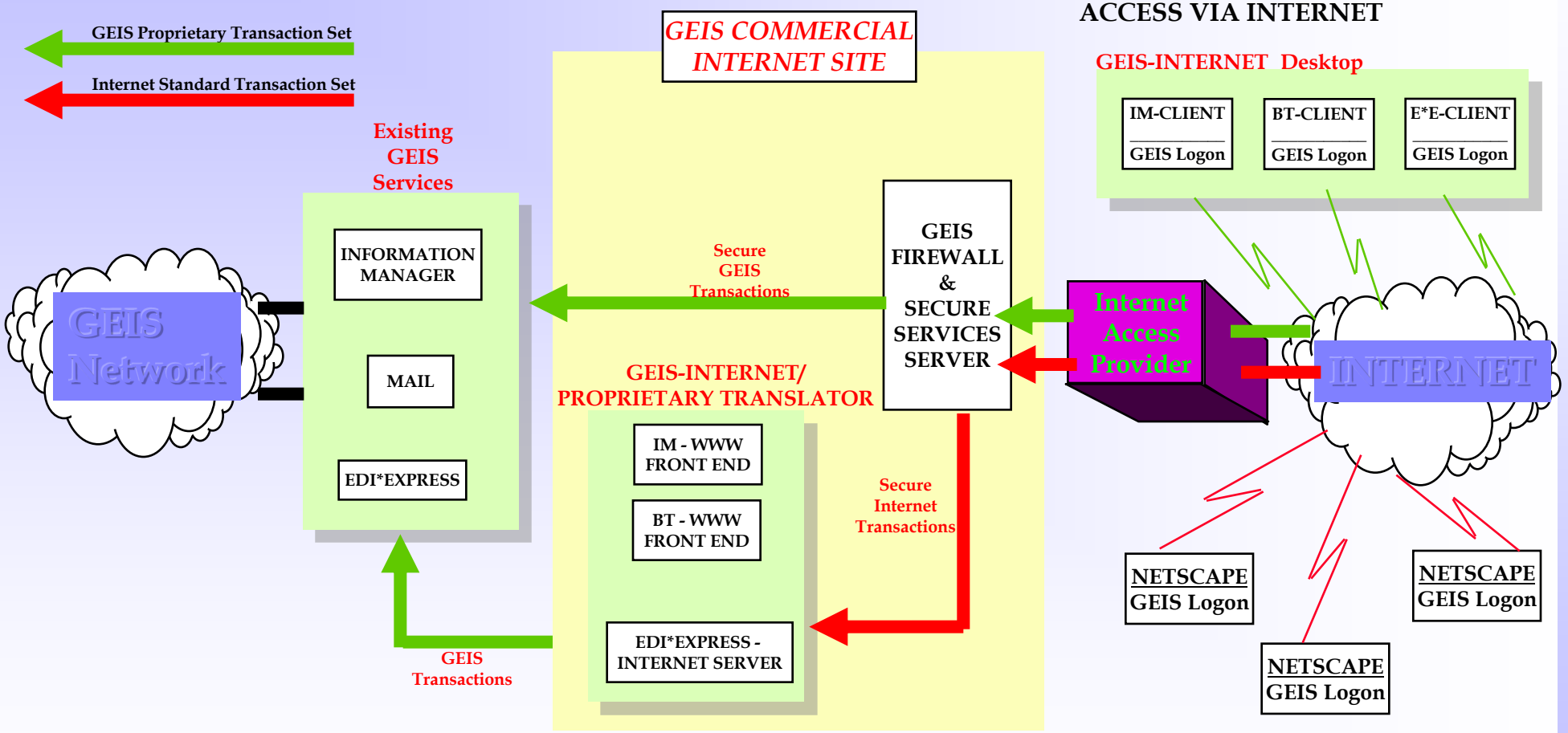
GEIS Internet Strategy (The Opportunity)



Increased Productivity from a Standards Based Desktop that Provides both Public & Private Business Solutions

Market Strategy (Internet Phase 1 Service Offering)

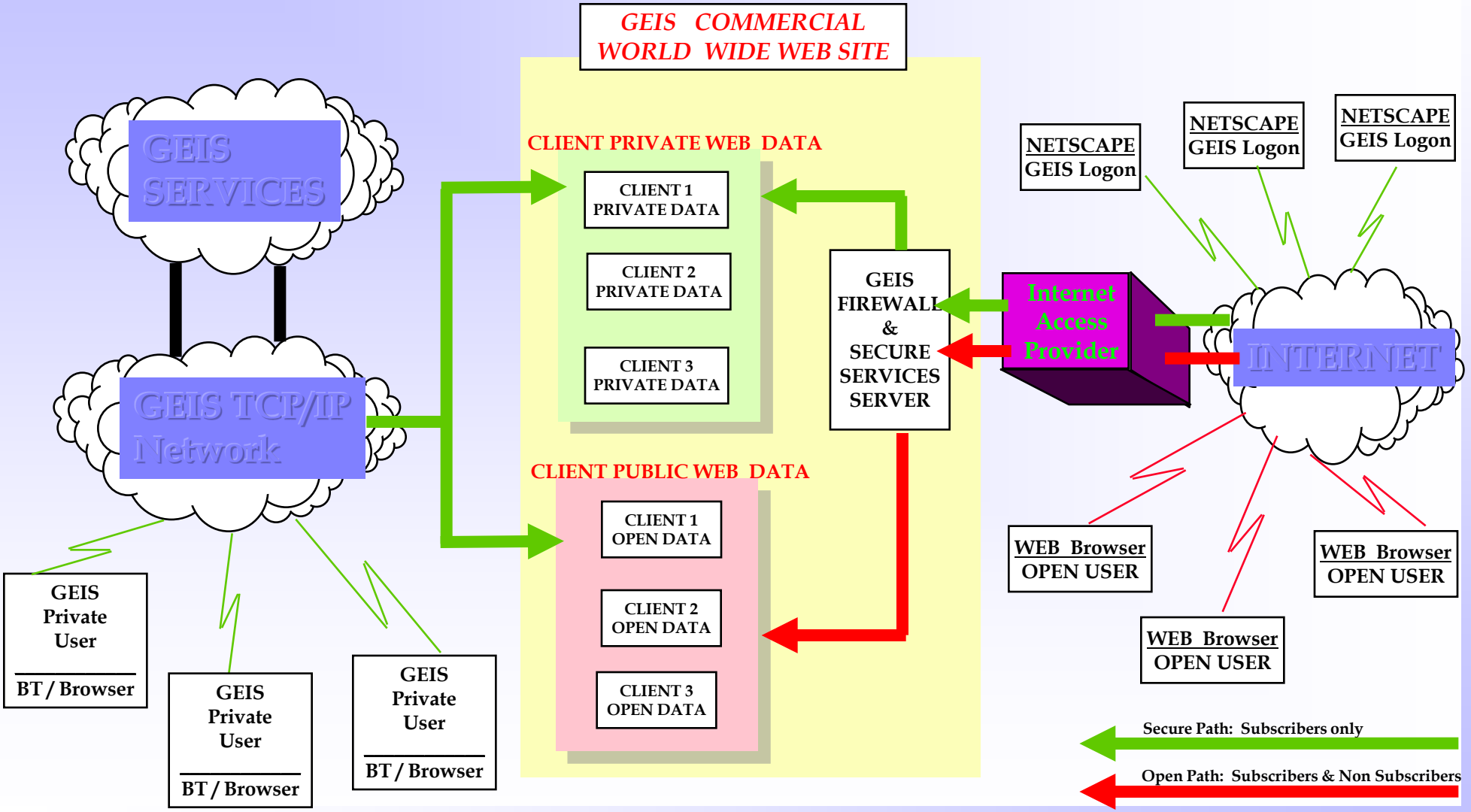
Private/Public access to GEIS web hosts



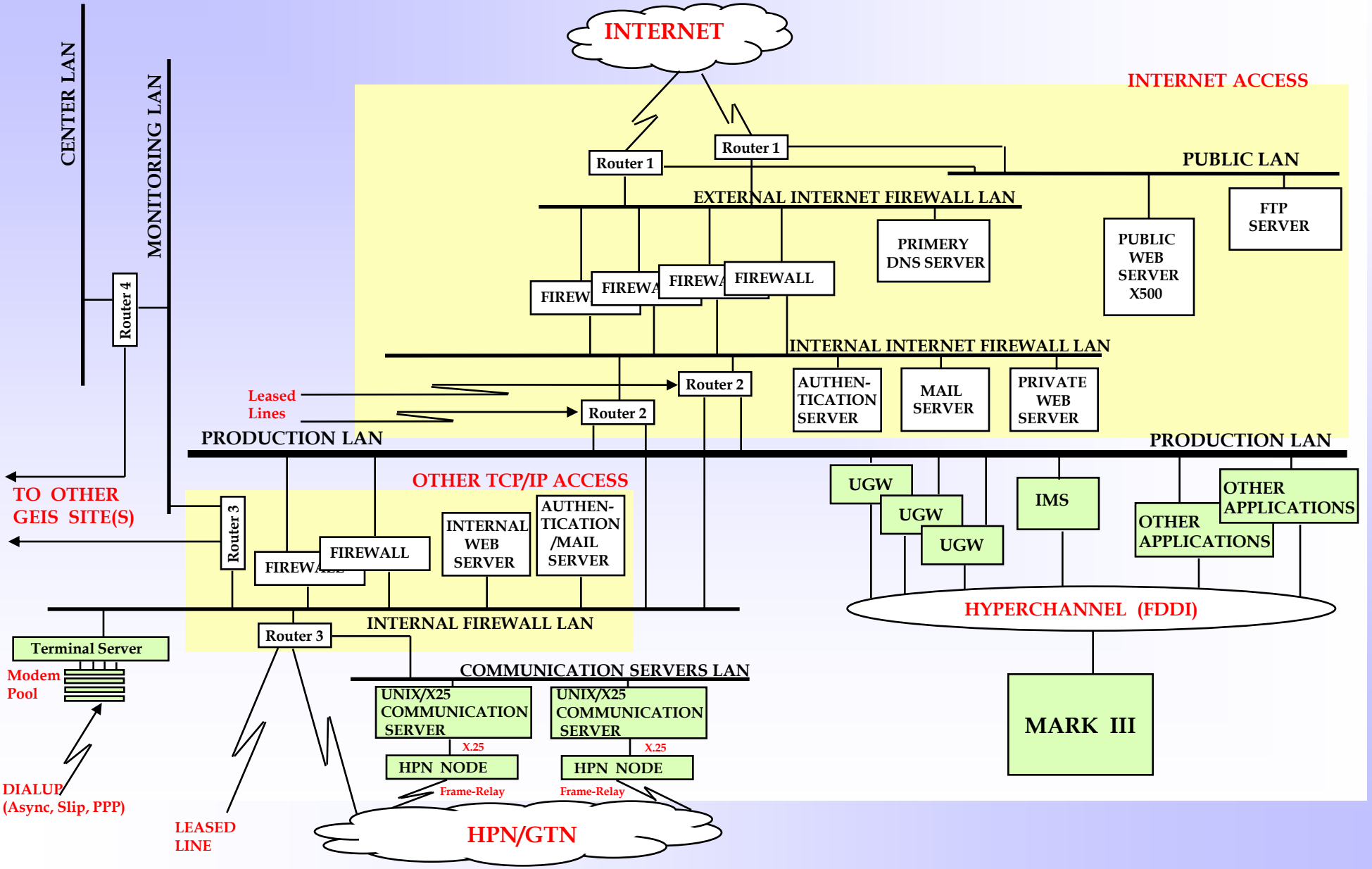
Press announcement made; Commercial offering targeted 4th Qtr '95

Market Strategy (Second Service Offering)

Private/Public access to GEIS web hosts



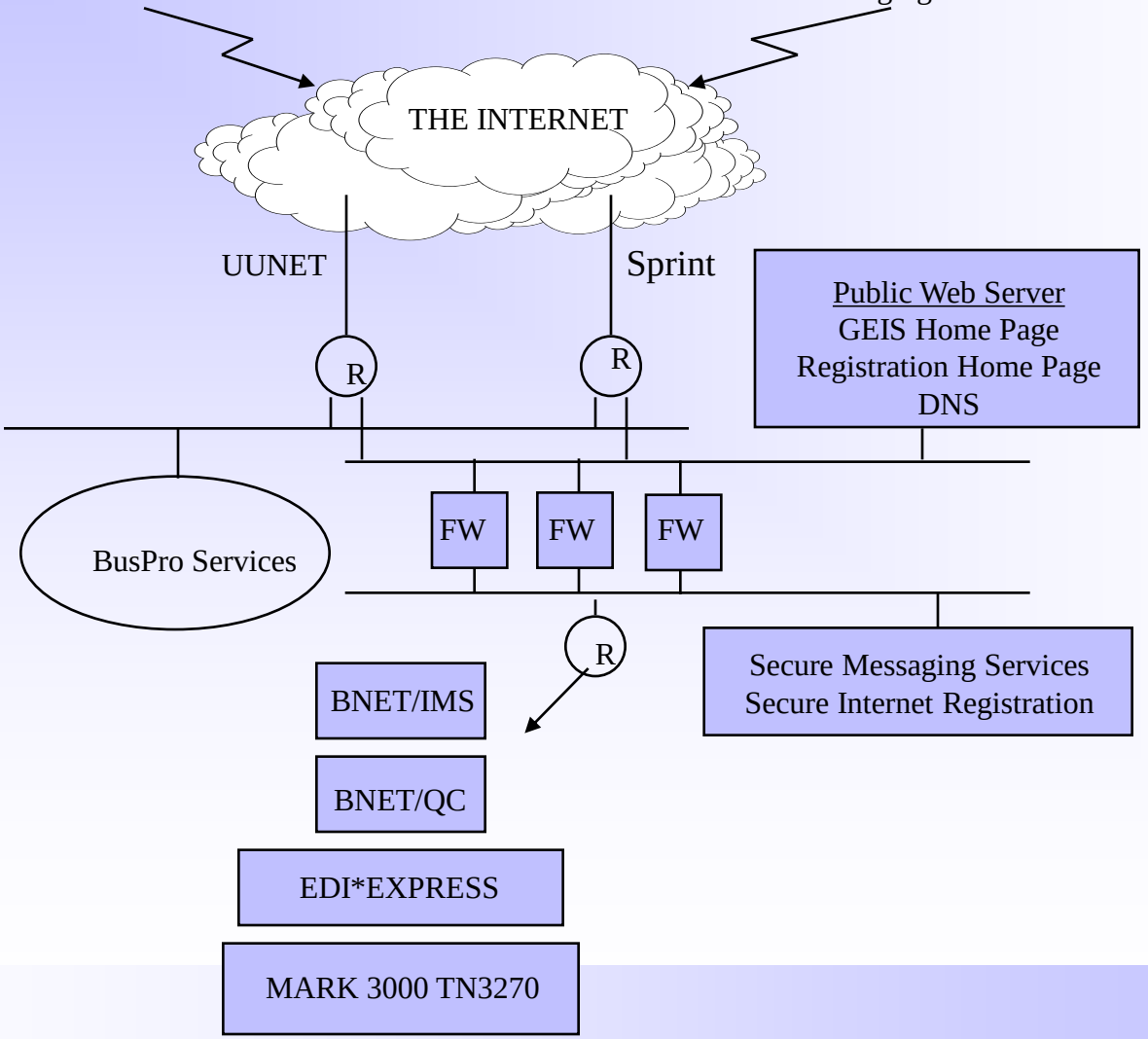
INTERNET access (Architectural overview)



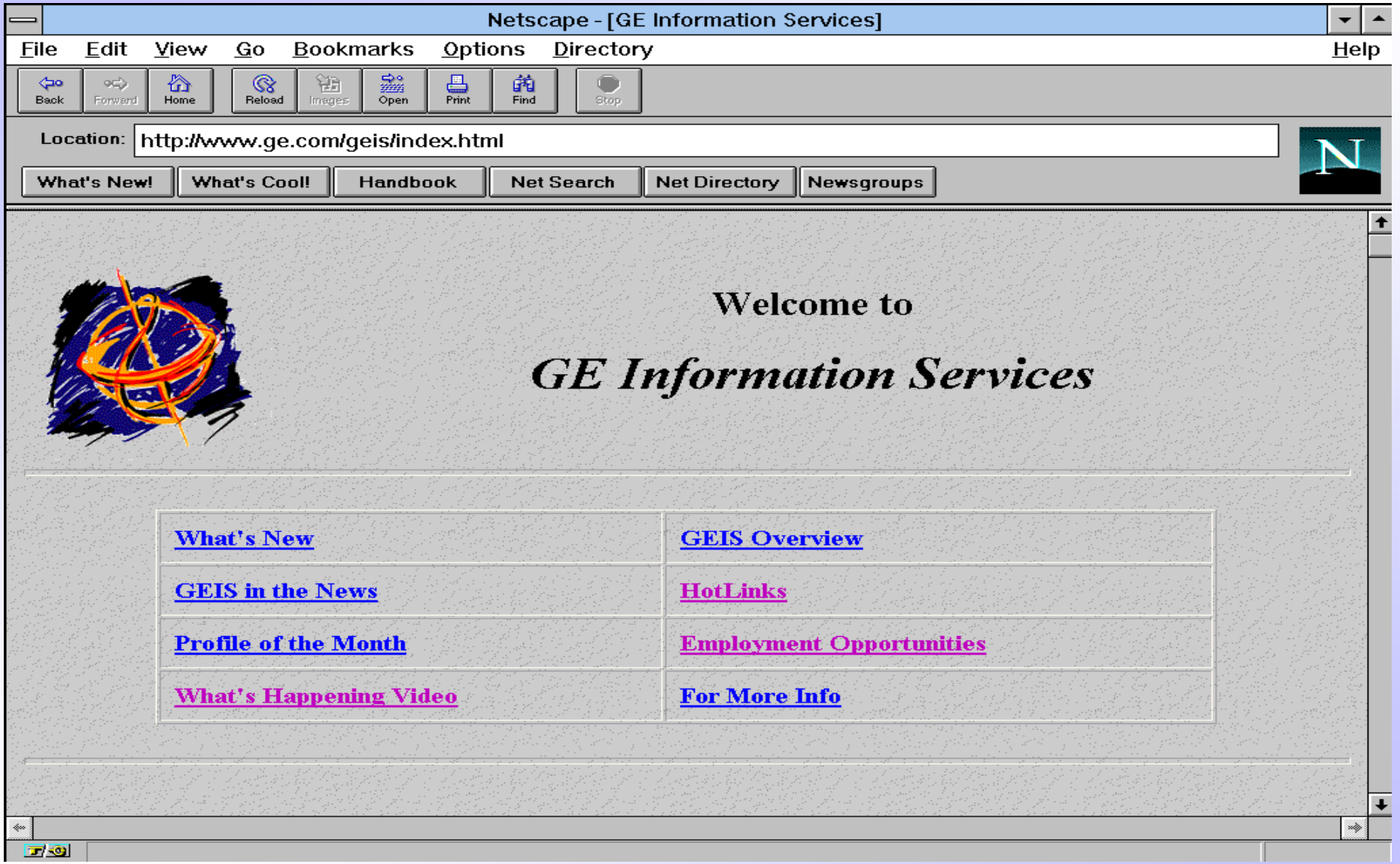
Phase 1 Internet Services

PC Access:
with BNET 2.2 to BNET/IMS or BNET/QC
with BNET EDI to EDI*EXPRESS
with TN3270 software to MARK3000

Web Browser Access:
to GEIS Home Page
to Secure Internet Registration
to Secure Messaging Services



GEIS Internet Strategy (Home Page Example)



GEIS Quality Measurements

The Greater the Quality.....
The Greater the opportunity

Major Quality Measurements

CII

Customer Impact Index

measures the unfavorable impact on operations caused by GEIS and reported by customers

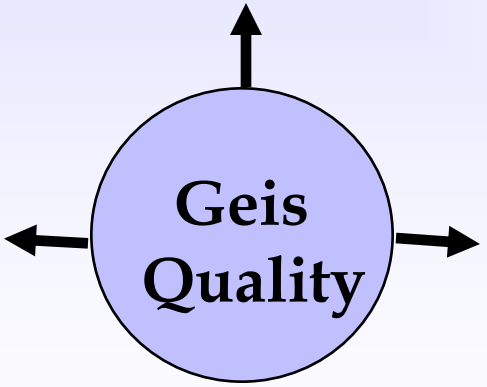
- embraced by all employees--tied to compensation.
- great progress over '93-'95
  -33% improvement in '94
  -36% improvement in '95

CSI

Customer Satisfaction Index

measures customer perception of the GEIS overall service quality (based on customer survey)

- 25% improvement in '94-'95
- surpassing competitors in several key areas
- focusing on areas of opportunity



CQI

Cost of Quality Index

measures the major costs of bad quality as a % of revenue

- a new measure-introduction targeted 1/1/96

CQP

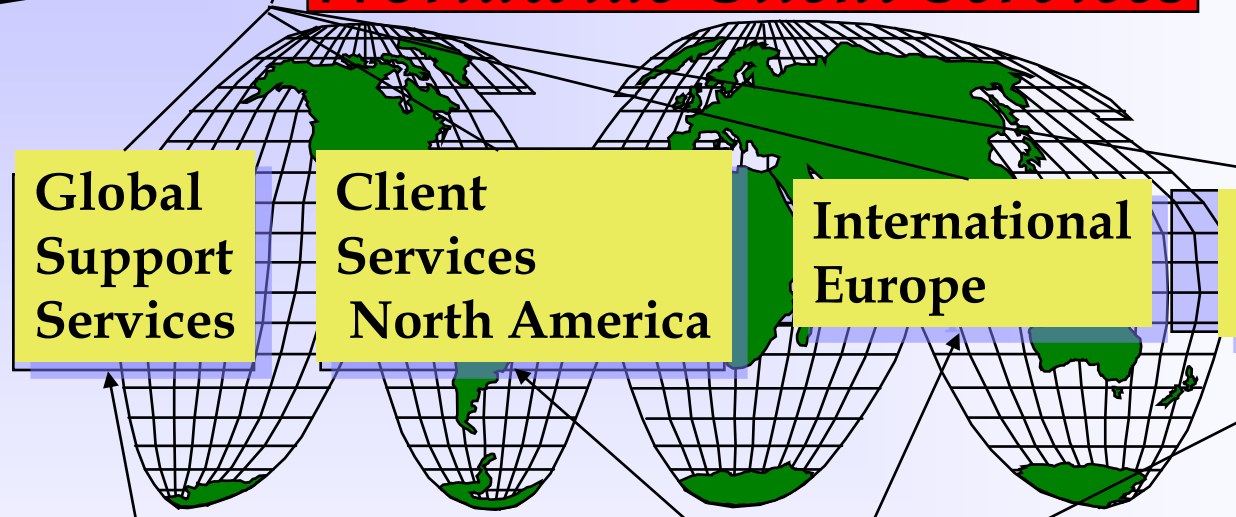
Quality Call Process

Daily Quality Report

closure

escalation

Worldwide Client Services



Global Support Services

Client Services North America

International Europe

International Aspac

feedback

- Countries without a local
- GEIS presence
- Local service providers
- Clients

Client Services Desk

Client problem

Target is to resolve 75% of all problems within 2 hours

Security??

PHYSICAL SECURITY

COMPUTER CENTERS

- **Protection From Outsiders**
  - Full-Time Guard Force
  - TV Surveillance
  - Motion Detection Systems
  - Alarm Systems
- **Internal Access Controls**
  - Badge Exchange Process
  - Badge Readers

PHYSICAL SECURITY

COMPUTER CENTERS

- **Protection From Hazards**
  - Heat/Smoke/Fire/Water Detectors
  - Automatic Halon®/ Inergen Systems
  - Redundant Air Conditioning
  - Power Anomaly Detection
  - UPS System
  - Onsite Power Generation
- **All Alarms Are Local and Remote**

PHYSICAL SECURITY

NETWORK DISTRIBUTION CENTERS

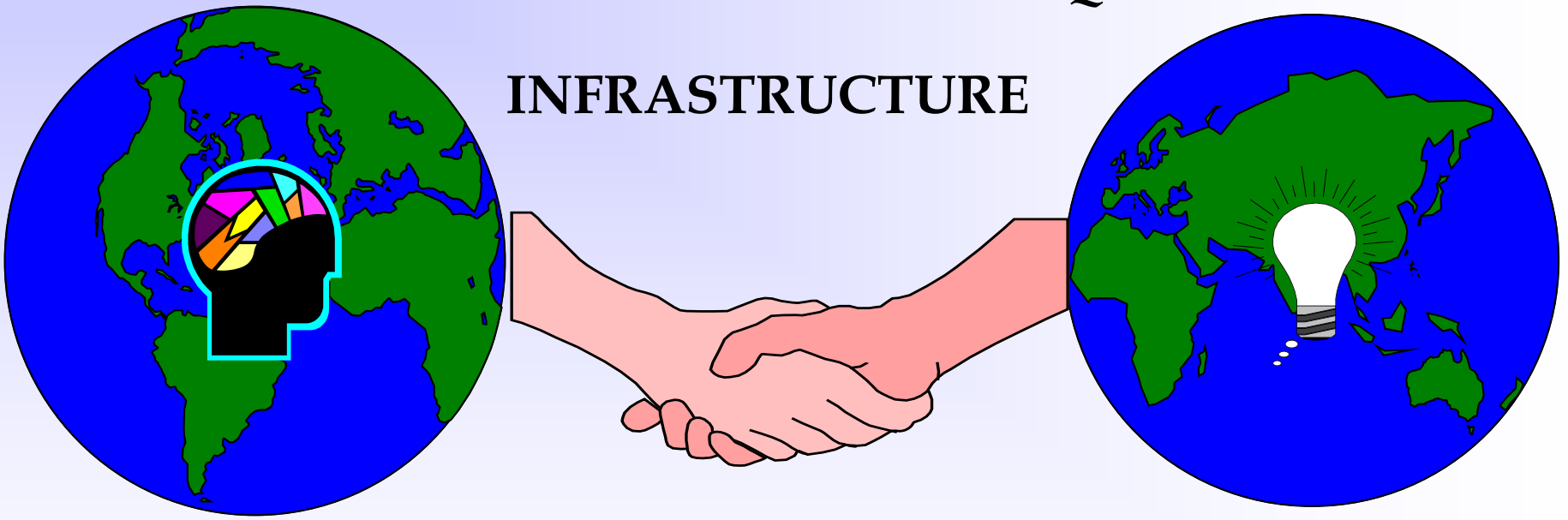
- **Protection From Outsiders**
  - Low-Visibility Site
  - Mantrap Entrance
  - Alarm Systems
- **Protection From Hazards**
  - Heat/Smoke/Fire/Water Detectors
  - Multiple Air Conditioners
  - Power Anomaly Detection
  - UPS System
  - Onsite Power Generation - Most Sites
- **All Alarms Are Local and Remote**

TECHNICAL OPERATIONS Never Ending Goal

PROVISION of

WORLDWIDE LOW COST HIGH QUALITY

INFRASTRUCTURE



KNOWLEDGE TEAMING INNOVATION